OPERATION AND SERVICE MANUAL
FOR
SHIPBOARD ELECTRIC
STEAM JACKETED KETTLES
LEC AND HEC SERIES

S6161-NY-FSE-010 DATED JANUARY 1990 CANCELS AND SUPERCEDES
S6161-C6-FSE-010 DATED DECEMBER 1986 AND ALL CHANGES THERETO

PUBLISHED BY DIRECTION
COMMANDER, NAVAL SEA SYSTEMS COMMAND

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APPROVAL AUTHORITY: DEFENSE GENERAL SUPPLY LETTER

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REMARKS:

DATE:

CERTIFICATION:

IT IS HEREBY CERTIFIED THAT THE TECHNICAL MANUAL PROVIDED UNDER CONTRACT NUMBER DLA400-89-C-2079 FOR STEAM JACKETED KETTLES, ELECTRICALLY HEATED HAS BEEN APPROVED BY THE APPROVAL DATA SHOWN ABOVE.

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FSCM 35550

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IDENTIFYING TECHNICAL PUBLICATION SHEET

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      WAYNESBORO, GEORGIA 30830
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TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 60 CONSISTING OF THE FOLLOWING:

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CHANGE RECORD

CHANGE #	DATE	TITLE/BRIEF DESCRIPTION	SIGNATURE OF VALIDATING OFFICER

SAFETY SUMMARY

GENERAL SAFETY NOTICES

THE FOLLOWING GENERAL SAFETY NOTICES SUPPLEMENT THE SPECIFIC WARNING AND CAUTIONS APPEARING ELSEWHERE IN THIS MANUAL. THEY ARE RECOMMENDED PRECAUTIONS THAT MUST BE UNDERSTOOD AND APPLIED DURING OPERATION AND MAINTENANCE OF THE EQUIPMENT COVERED HEREIN. SHOULD SITUATIONS ARISE THAT ARE NOT COVERED IN THE GENERAL OR SPECIFIC SAFETY PRECAUTIONS, THE COMMANDING OFFICER OR OTHER AUTHORITY WILL ISSUE ORDERS AS DEEMED NECESSARY TO COVER THE SITUATION.

DO NOT REPAIR OR ADJUST ALONE

UNDER NO CIRCUMSTANCES SHOULD REPAIR OR ADJUSTMENT OF ENERGIZED EQUIPMENT BE ATTEMPTED ALONE. THE IMMEDIATE PRESENCE OF SOMEONE CAPABLE OF RENDERING AID IS REQUIRED. BEFORE MAKING ADJUSTMENTS, BE SURE TO PROTECT AGAINST GROUNDING. IF POSSIBLE, ADJUSTMENTS SHOULD BE MADE WITH ONE HAND, WITH THE OTHER HAND FREE AND CLEAR OF EQUIPMENT. TO AVOID INJURIES, ALWAYS DISCONNECT POWER AND GROUND A CIRCUIT BEFORE WORKING ON IT.

TEST EQUIPMENT

MAKE CERTAIN TEST EQUIPMENT IS IN GOOD CONDITION. IF A TEST METER MUST BE HELD, GROUND THE CASE OF THE METER BEFORE STARTING MEASUREMENT.

INTERLOCKS

INTERLOCKS ARE PROVIDED FOR SAFETY OF PERSONNEL AND EQUIPMENT AND SHOULD BE USED FOR THE PURPOSES INTENDED. THEY SHOULD NOT BE BY PASSED OR OTHERWISE MODIFIED EXCEPT BY AUTHORIZED MAINTENANCE PERSONNEL. WHENEVER POSSIBLE, DISCONNECT POWER AT POWER DISTRIBUTION SOURCE.

RESUSCITATION

PERSONNEL WORKING WITH OR NEAR HIGH VOLTAGES SHOULD BE FAMILIAR WITH MODERN METHODS OF RESUSCITATION. SUCH INFORMATION MAY BE OBTAINED FROM THE BUREAU OF MEDICINE AND SURGERY.

THE FOLLOWING WARNINGS AND CAUTIONS APPEAR IN THE TEXT IN THIS MANUAL, AND ARE REPEATED HERE FOR EMPHISIS.

CAUTION : ALL ELECTRICAL EQUIPMENT MUST BE PROPERLY GROUNDED. FOR NAVAL SHIPBOARD USE, ELECTRICAL SYSTEM MUST BE UNGROUNDED.

CAUTION : USE DISTILLED OR VERY SOFT WATER WHEN FILLING THE STEAM JACKET. DISCONNECT POWER SUPPLY.

WARNING : NEVER ATTEMPT TO FILL KETTLE WHEN IT IS HOT.

CAUTION : DRAIN THE STEAM JACKET IF THE KETTLE IS STORED IN AN UNHEATED AREA. WATER FREEZING IN THE STEAM JACKET MAY RESULT IN PERMANENT DAMAGE TO THE UNIT.

CAUTION : DISCONNECT POWER BEFORE ATTEMPTING TO SERVICE THIS EQUIPMENT. DO NOT SERVICE A KETTLE THAT IS HOT.

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INTRODUCTION

LEGION ELECTRICALLY HEATED KETTLES ARE WIDELY USED THE WORLD OVER IN SCHOOLS, RESTAURANTS, COMMISSARIES, CAFETERIAS, MESS HALLS, AND WHEREVER AN EXTERNAL STEAM SOURCE IS NOT AVAILABLE.

INNER KETTLE SHELLS ARE SEAMLESS DIE DRAWN OF NOT LESS THAN 14 GA. (.078 IN.) STAINLESS STEEL.

STANDARD EQUIPMENT INCLUDES A FULL COMPLEMENT OF AUTOMATIC CONTROLS INCLUDING AN AUTOMATIC AIR ELIMINATOR, THERMOSTAT, FLOATLESS ELECTRONIC LIQUID LEVEL CONTROL, AND 30 PSI SAFETY VALVE. ACCESSORIES INCLUDE A 1 1/2" TANGENTIAL DRAW-OFF VALVE, STRAINER, COMPOUND VACUUM-PRESSURE GAUGE AND A VISIBLE WATER LEVEL INDICATOR.

ALL KETTLES ARE U.L. LISTED, AND CONSTRUCTED IN COMPLIANCE WITH A.S.M.E. CODE REQUIREMENTS FOR PRESSURE VESSELS AT 30 P.S.I. MAX. DESIGN PRESSURE. ALL BEAR THE SEAL OF THE NATIONAL SANITATION FOUNDATION AND ARE SO LISTED.

I

GENERAL INFORMATION

THE "LEGION" DESIGNED ELECTRIC KETTLE FEATURES SEAMLESS DRAWN SHELLS, FULL BODY INSULATION AND A CONTROLLED TEMPERATURE RANGE OF 150 TO 290 F.

EACH KETTLE IS FITTED WITH A PRESSURE GAUGE, SAFETY RELIEF VALVE AND WATER LEVEL SIGHT GLASS. IT COMES COMPLETELY EQUIPPED WITH THERMOSTAT, LOW WATER CUT-OFF PROTECTION WITH WARNING LIGHT AND HEATING PILOT LIGHT. IN ADDITION, THE HEATING ELEMENTS ARE FIELD REPLACEABLE.

THESE INSTRUCTIONS SHOULD BE READ THOROUGHLY BEFORE ATTEMPTING INSTALLATION, OPERATION OR MAINTENANCE. LEGION INDUSTRIES, INC. RESERVES THE RIGHT TO RENDER VOID ANY WARRANTY ON EQUIPMENT NOT INSTALLED IN ACCORDANCE WITH THE MANUAL BY A QUALIFIED SERVICE TECHNICIAN (A PERSON EXPERIENCED IN AND KNOWLEDGEABLE CONCERNING THE INSTALLATION OF COMMERICAL STEAM, GAS AND/OR ELECTRICAL COOKING EQUIPMENT).

II

INSTALLATION

MOUNTING AND LOCATION:

UNPACK UNIT CAREFULLY, CHECK FOR ANY DAMAGE THAT MAY HAVE OCCURED DURING SHIPMENT. NOTIFY THE CARRIER AND LEGION INDUSTRIES, INC. IF AND DAMAGE WAS SUSTAINED.

LEVEL KETTLE BY ADJUSTING FEET.

POSITION EQUIPMENT IN PERMANENT LOCATION, ALLOWING AMPLE SPACE AROUND UNIT IN ORDER TO PERFORM ROUTINE CLEANING AND MAINTENANCE, AS WELL AS PROPER OPERATION. ANCHOR THE UNIT SECURELY.
(SEE FIG. R-573A)

STRICT ADHERENCE MUST BE PAID TO THE ELECTRICAL REQUIREMENTS OF YOUR UNIT AS LISTED ON THE NAME PLATE TO BE SURE THAT YOUR AVAILABLE POWER SUPPLY LINE IS CAPABLE OF POWERING THE UNIT PROPERLY.

ALL ELECTRICAL CONNECTIONS MUST BE IN ACCORDANCE WITH ANY APPLICABLE ELECTRICAL CODES.

CONNECT THE POWER SUPPLY LINE TO THE UNIT. IT IS ADVISED, AND MOST ELECTRICAL CODES REQUIRE, THAT AN ELECTRICAL CUT-OFF DEVISE, SUCH AS A FUSED DISCONNECT SWITCH OR EQUIVALENT, BE INSTALLED IN THE POWER SUPPLY LINE BETWEEN THE MAIN AND THE UNIT.

CAUTION : ALL ELECTRICAL EQUIPMENT MUST BE PROPERLY GROUNDED FOR NAVAL SHIPBOARD SUE, ELECTRICAL SYSTEM MUST BE UNGROUNDED.

TO FILL, OPEN VALVE AND PLACE A FUNNEL IN THE INLET NIPPLE. ADD WATER TO THE MAXIMUM LEVEL, BUT NOT ABOVE, THE GAUGE GLASS. REMOVE FUNNEL AND CLOSE VALVE TIGHTLY. (SEE FIG. TS-217A)

OPERATION

DAILY OPERATION

CHECK WATER LEVEL IN THE WATER GAUGE GLASS. REFILLING THE STEAM JACKET IS SELDOM NECESSARY, HOWWEVER SHOULD THE WATER LEVEL GO BELOW THE MINIMUM LEVEL, ADD WATER TO THE MAXIMUM LEVEL MARK, BUT NOT ABOVE. (SEE FIG. TS-217A)

CAUTION : USE DISTILLED OR VERY SOFT WATER. DISCONNECT ELECTRIC POWER.

WARNING : NEVER ATTEMPT TO FILL KETTLE WHEN IT IS HOT.

TO FILL, OPEN VALVE AND PLACE A FUNNEL IN THE INLET NIPPLE - ADD WATER UNTIL WATER IS AT THE MAXIMUM LEVEL MARK, BUT NOT ABOVE. REMOVE FUNNEL AND CLOSE VALVE TIGHTLY.

ON KETTLES THAT HAVE THE OPTIONAL AUTOMATIC WATER FILL SYSTEM, MAKE SURE WATER SUPPLY LINE TO THE KETTLE IS OPEN.

NOTE: THE THERMOSTAT MUST BE "ON" FOR THE AUTOMATIC FILL VALVE TO OPERATE.

TO OPERATE THE KETTLE, SET THE THERMOSTAT DIAL TO THE DESIRED COOKING TEMPERATURE. THE KETTLE WILL HEAT THE PRODUCT IN THE COOKING CHAMBER TO THE PRE-SET TEMPERATURE AND AUTOMATICALLY MAINTAIN THE TEMPERATURE FOR AN INDEFINITE PERIOD OF TIME.

NEW TEMPERATURE SETTING:

IF A NEW TEMPERATURE IS DESIRED DURING COOKING OPERATION SIMPLY TURN THERMOSTAT DIAL TO A NEW SETTING. SHOULD THE NEW TEMPERATURE DESIRED BE MORE THAN 60 DEGREES F, LOWER THAN THE INITIAL SETTING, IT WILL BE NECESSARY TO WAIT FOR THE KETTLE TEMPERATURE TO DROP. UNIT WILL AGAIN MAINTAIN TEMPERATURE SETTING.

PLACE THE THERMOSTAT IN THE "OFF" POSITION WHEN THE KETTLE IS NOT IN USE.

IV

MAINTENANCE

(4-1) CLEANING OF EQUIPMENT

PLACE MAIN DISCONNECT SWITCH IN "OFF" POSITION BEFORE WASHING KETTLE.

WASH KETTLE BEFORE AND AFTER EACH USE WITH HOT SOAPY WATER AND RINSE INSIDE THOROUGHLY WITH CLEAN HOT WATER. DO NOT USE HOSE ON OUTSIDE OF KETTLE, WASH OUTSIDE OF KETTLE THOROUGHLY WITHOUT ALLOWING WATER TO ENTER INTO CONTROL HOUSING. DRY THOROUGHLY INSIDE AND OUTDIDE.

IN THE EVENT THE CONTROLS REQUIRE CLEANING, CARE MUST BE TAKEN TO PREVENT MOISTURE FROM SETTLING ON THE CONTROLS.

CLEAN STRAINER, DRAWOFF VALVE AND DRAWOFF TUBE AFTER EACH USE.

THE STAINLESS STEEL SURFACE OF THE KETTLE MAY BE POLISHED WITH ANY RECOGNIZED COMMERICAL STAINLESS STEEL CLEANER.

DO NOT USE STEEL WOOL OR ANY ABRASIVE FOR CLEANING.

WORK SAFETY VALVE DAILY.

LEAVE COVER OPEN WHEN NOT IN USE.

(4-2) CORRECTIVE MAINTENANCE

WARNING : DISCONNECT POWER BEFORE ATTEMPTING TO SERVICE THIS EQUIPMENT. DO NOT SERVICE A KETTLE THAT IS HOT.

THE HEATER(S), THE CONTACTOR(S), AND ALL CONTROLS ARE LOCATED IN THE CONSOLE ON THE RIGHT HAND SIDE OF THE KETTLE. THESE COMPONENTS ARE ACCESSIBLE WITH THE CONSOLE COVER REMOVED.

IMPORTANT : MARK OR NOTE WIRING CONNECTIONS BEFORE REMOVING FROM COMPONENTS.

NO SPECIAL TOOLS ARE REQUIRED FOR REMOVAL OR REPLACEMENT OF MAL-FUNCTIONING COMPONENTS.

MOST ELECTRICAL COMPONENT FAILURES CAN BE EASILY DIAGNOSED BY FOLLOWING A LOGICAL PROCESS OF ELIMINATION. THE PRESSURE SWITCH, THERMOSTAT AND PRIMARY COIL ON THE TRANSFORMER (480 VOLT ONLY) CAN BE TESTED FOR CONTINUITY. AN OPEN CIRCUIT INDICATES THAT THE COMPONENT HAS FAILED. IT IS NECESSARY TO DISCONNECT THE HEATER WIRES FROM THE CONTACTOR(S) BEFORE TESTING THE HEATING ELEMENT(S) FOR CONTINUITY. THE COILS ON THE LOW WATER CONTROL RELAY, CONTACTOR(S), SECONDARY COIL OF THE TRANSFORMER (480 VOLT ONLY), AND THE THERMOSTAT INDICATOR LIGHT CAN ALSO BE TESTED FOR CONTINUITY; HOWEVER, IT WILL BE NECESSARY TO DISCONNECT THESE COMPONENTS FROM THE CIRCUIT BEFORE TESTING. ALSO CHECK THE TRANSFORMER FOR COIL TO COIL SHORTING IF ANY CONTROL CIRCUIT COMPONENTS HAVE FAILED. REFERENCE APPROPRIATE FIGURE FOR MODEL TO BE SERVICED FOR WIRING DIAGRAMS AND SCHEMATICS.

HEATER ELEMENT FAILURE MAY BE ATTRIBUTED TO CHATTERING OF THE CONTACTOR(S) OR THE LOW WATER CONTROL RELAY, CAUSED BY BURNED OR PITTED POINTS. REPLACE POINTS IF BURNING OR PITTING HAS OCCURRED.

TO REPLACE THE THERMOSTAT, MARK AND DISCONNECT WIRING TERMINALS AND REMOVE THE THERMOBULB FROM ITS KETTLE COUPLING. REMOVE MOUNTING SCREWS AND DEFECTIVE COMPONENT. INSTALL NEW THERMOBULB IN KETTLE COUPLING AND MOUNT THERMOSTAT IN POSITION. REINSTALL MOUNTING SCREWS AND REPLACE WIRING TERMINATIONS.

TO REPLACE THE LOW WATER CONTROL RELAY, PRESSURE SWITCH, OR TRANSFORMER, MARK AND DISCONNECT WIRING TERMINALS. REMOVE MOUNTING SCREWS AND DEFECTIVE COMPONENT FROM THE CONSOLE. MOUNT NEW COMPONENT IN POSITION, REINSTALL MOUNTING SCREWS, AND REPLACE WIRING TERMINATIONS.

REMOVE THE LOW WATER ELECTRODE PROBE AND VISUALLY CHECK THE PORCELAIN INSULATOR FOR CRACKS OR SCALE BUILD UP ON THE TIP. CLEAN IF SCALE IS PRESENT AND REINSTALL. REPLACE PROBE IF ANY CRACKING IS EVIDENT.

TO REPLACE A HEATING ELEMENT, DISCONNECT THE LEADS OF THE DEFECTIVE ELEMENT AT THE CONTACTOR. UNSCREW THE DEFECTIVE ELEMENT FROM ITS COUPLING. INSTALL NEW ELEMENT IN COUPLING AND RECONNECT WIRES TO THE CONTACTOR. (SEE APPROPRIATE WIRING DIAGRAM)

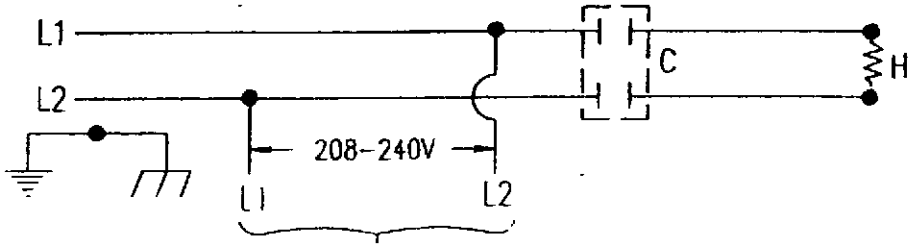
MAKE SURE ALL COVERS ARE REPLACED AFTER ALL REPAIRS ARE COMPLETED.

SYMPTOM	POSSIBLE CAUSE	REMEDY PROCEDURE
NO HEAT AMBER LIGHT OFF	HEATER FAILURE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) ALLOW KETTLE TO COOL. NEVER ATTEMPT TO DRAIN A HOT KETTLE 4) LIFT THE SAFETY VALVE TO RELEASE ANY RESIDUAL STEAM CONTAINED IN THE STEAM JACKET. 5) DRAIN WATER IN STEAM JACKET BY REMOVING PLUG IN THE BOTTOM OF VESSEL. 6) REMOVE INSTRUMENT PANEL HOOD. 7) LABEL AND DISCONNECT WIRES TO HEATERS. (SEE APPROPRIATE WIRING DIAGRAM) 8) CHECK CONTINUITY OF HEATERS WITH MULTIMETER. 9) IF HEATER(S) ARE SHORTED, UNSCREW HEATERS AND REPLACE. IF NOT, REINSTALL. REVERSE PROCEDURE FOR INSTALLATION.
	CONTACTOR FAILURE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) REMOVE INSTRUMENT PANEL HOOD. 4) LABEL AND DISCONNECT WIRES TO CONTACTOR. (SEE APPROPRIATE WIRING DIAGRAM) 5) LOOSEN SCREWS ON CONTACTOR AND REMOVE. 6) CHECK CONTINUITY ON CONTACTOR COILS WITH MULTI-METER AND CHECK CONTACTS FOR BURN OUT. 7) IF COILS ARE SHORTED REPLACE CONTACTOR. IF NOT, REINSTALL. REVERSE PROCEDURE FOR INSTALLATION. 8) IF CONTACTS ARE BURNED OUT AND COILS ARE GOOD, REPLACE CONTACTS. REVERSE PROCEDURE FOR INSTAL-LATION.

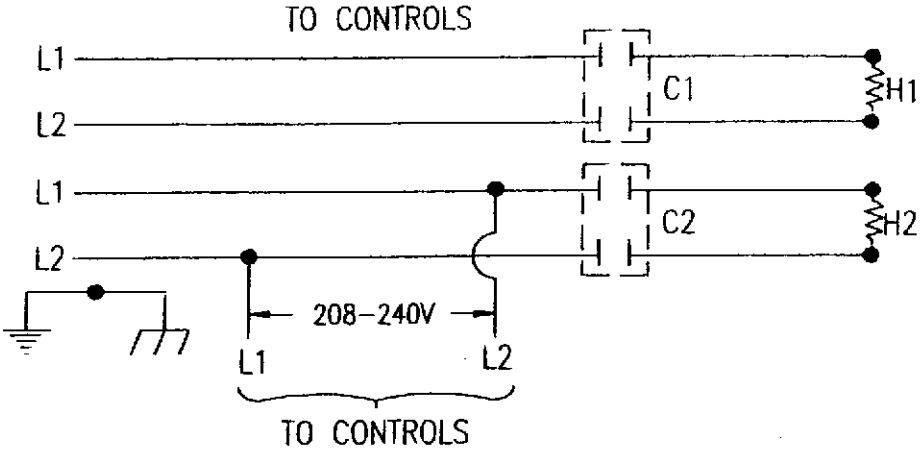
SYMPTOM	POSSIBLE CAUSE	REMEDY PROCEDURE
NO HEAT AMBER LIGHT OFF	NO POWER TO UNIT	1) CONNECT UNIT TO POWER SUPPLY. 2) CHECK FUSE BLOCK FOR CONTINUITY WITH MULTIMETER. 3) REPLACE FUSE IF NECESSARY. (SEE APPROPRIATE WIRING DIAGRAM)
	TRANSFORMER FAILURE (480 - 440V ONLY)	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) REMOVE INSTRUMENT PANEL HOOD. 4) LABLE AND DISCONNECT WIRES TO TRANSFORMER. (SEE APPROPRIATE WIRING DIAGRAM) 5) LOOSEN SCREWS ON TRANSFORMER AND REMOVE. 6) CHECK CONTINUITY OF TRANSFORMER FROM COIL TO COIL WITH MULTIMETER. 7) IF TRANSFORMER IS SHORTED, REPLACE. REVERSE PROCEDURE FOR INSTALLATION.
	WATER LEVEL IN JACKET TOO LOW.	1) SEE FIG. TS 217A
	SCALE ON LOW WATER PROBE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) ALLOW KETTLE TO COOL. NEVER ATTEMPT TO DRAIN A HOT KETTLE. 4) LIFT THE SAFETY VALVE TO RELEASE ANY RESIDUAL STEAM CONTAINED IN THE STEAM JACKET. 5) DRAIN WATER IN STEAM JACKET BY REMOVING PLUG IN THE BOTTOM OF VESSEL. 6) REMOVE INSTRUMENT PANEL HOOD. 7) LABLE AND DISCONNECT WIRES FROM PROBE. (SEE APPROPRIATE WIRING DIAGRAM) 8) UNSCREW PROBE FROM OUTER SHELL. 9) CHECK PROBE FOR CRACKS. IF CRACKS ARE FOUND, REPLACE AND REVERSE PROCEDURE FOR INSTALLATION. 10) IF PROBE HAS NO CRACKS, CLEAN WITH 3M SCOTCHBRITE CLOTH. REVERSE PROCEDURE FOR INSTALLATION.

SYMPTOM	POSSIBLE CAUSE	REMEDY PROCEDURE
NO HEAT AMBER LIGHT OFF	THERMOSTAT FAILURE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) ALLOW KETTLE TO COOL. NEVER ATTEMPT TO DRAIN A HOT KETTLE. 4) LIFT THE SAFETY VALVE TO RELEASE ANY RESIDUAL STEAM CONTAINED IN THE STEAM JACKET. 5) DRAIN WATER IN STEAM JACKET BY REMOVING PLUG IN THE BOTTOM OF VESSEL. 6) LABLE AND DISCONNECT WIRING TO THE THERMOSTAT. 7) REMOVE THE THERMOBULB FROM ITS KETTLE COUPLING AND MOUNTING SCREWS ON THERMOSTAT. (SEE FIG TS2184 8) CHECK THERMOSTAT FOR CONTINUITY WITH MULTIMETER. 9) IF CIRCUIT IS OPEN, REPLACE THERMOSTAT. IF NOT REINSTALL. REVERSE PROCEDURE FOR INSTALLATION. 10) IF THERMOSTAT ADJUSTMENT IS NEEDED FOLLOW INSTRUCTIONS
	LOW WATER RELAY FAILURE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY 3) ALLOW KETTLE TO COOL AND RELEASE RESIDUAL STEAM. THROUGH SAFETY VALVE. 4) REMOVE INSTRUMENT PANEL HOOD. 5) LABEL AND DISCONNECT WIRES FROM SWITCH. (SEE APPROPRIATE WIRING DIAGRAM) 6) CHECK CONTINUITY ON SWITCH WITH MULTIMETER. 7) IF CIRCUIT IS OPEN, REPLACE SWITCH. IF NOT, REINSTALL. REVERSE PROCEDURE FOR INSTALLATION. 8) SEE FIG TS124A FOR ADJUSTMENT PROCEDURES.
	PRESSURE SWITCH FAILURE	1) TURN POWER OFF. 2) DISCONNECT POWER SUPPLY. 3) REMOVE INSTRUMENT PANEL HOOD. 4) LABLE AND DISCONNECT WIRES FROM RELAY. (SEE APPROPRIATE WIRING DIAGRAM) 5) LOOSEN SCREWS ON RELAY AND REMOVE. 6) CHECK CONTINUITY ON RELAY WITH MULTIMETER. 7) IF CIRCUIT IS OPEN, REPLACE RELAY. IF NOT, REINSTALL. REVERSE PROCEDURE FOR INSTALLATION.

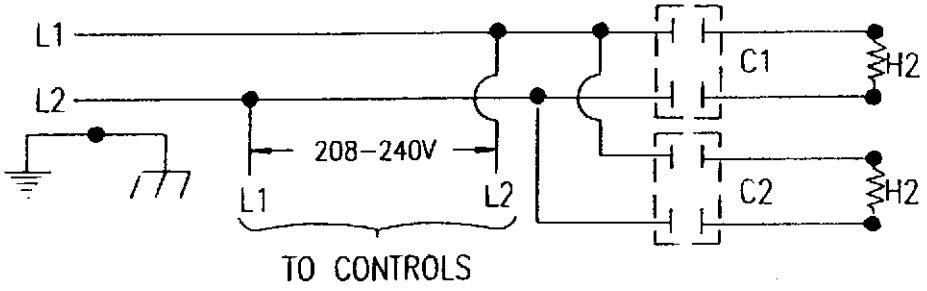
LEC-20,30, & 40
HEC & TWE-20
208-240V
1Φ SUPPLY



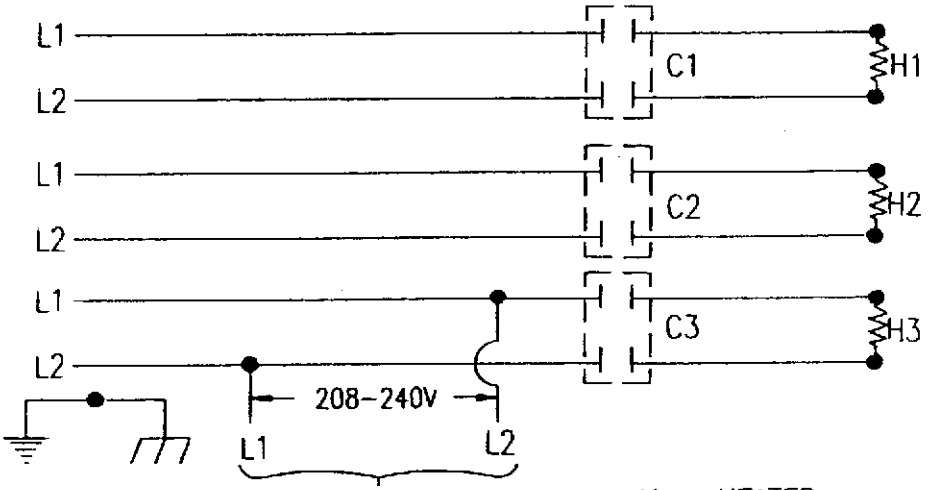
LEC-60
HEC & TWE-30 & 40
208V, 1Φ SUPPLY
OR LEC-80
208-240V
1 SUPPLY



LEC-60
HEC & TWE-30 & 40
220-240V, 1Φ SUPPLY



HEC & TWE-60 & 80
208-240V
1Φ SUPPLY
(3 CIRCUITS)



H = HEATER
C = CONTACTOR

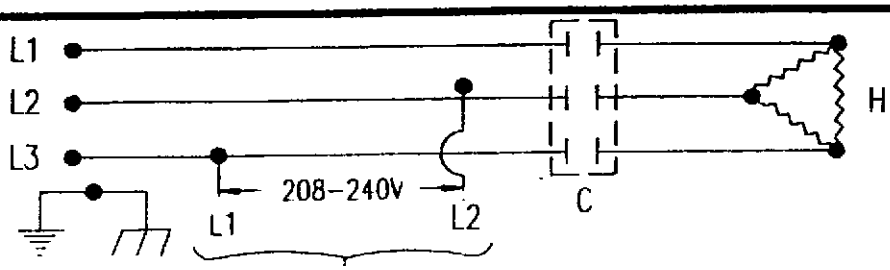
NOTES:
1 - SEE E-409A FOR CONTROL SCHEMATIC
2 - GROUNDS ARE NOT APPLICABLE TO NAVAL SHIPBOARD KETTLES.

HEATER CIRCUITS, SINGLE PHASE
LEC, HEC, & TWE

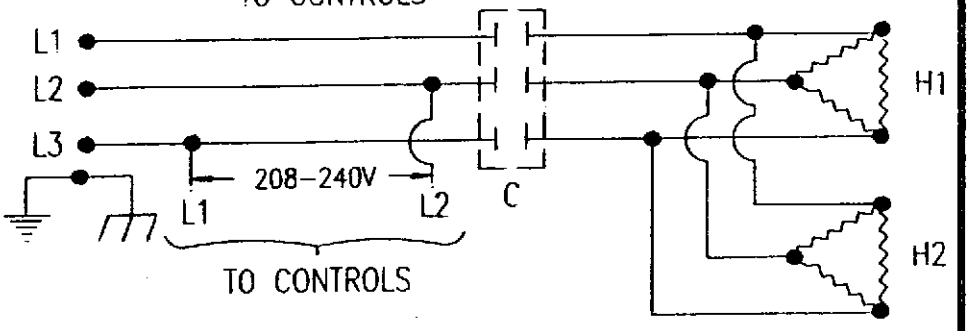
REV.0 (2/21/90)

LEGION
LEGION INDUSTRIES, INC.
E405A

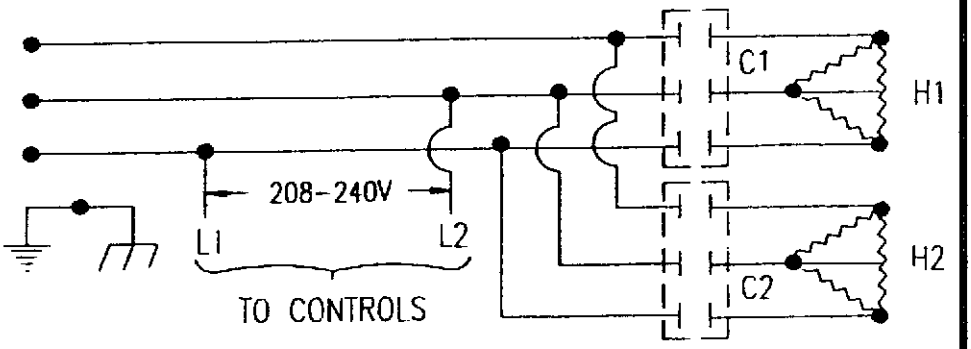
LEC-20,30, & 40
HEC & TWE-20
208-240V
3Φ SUPPLY



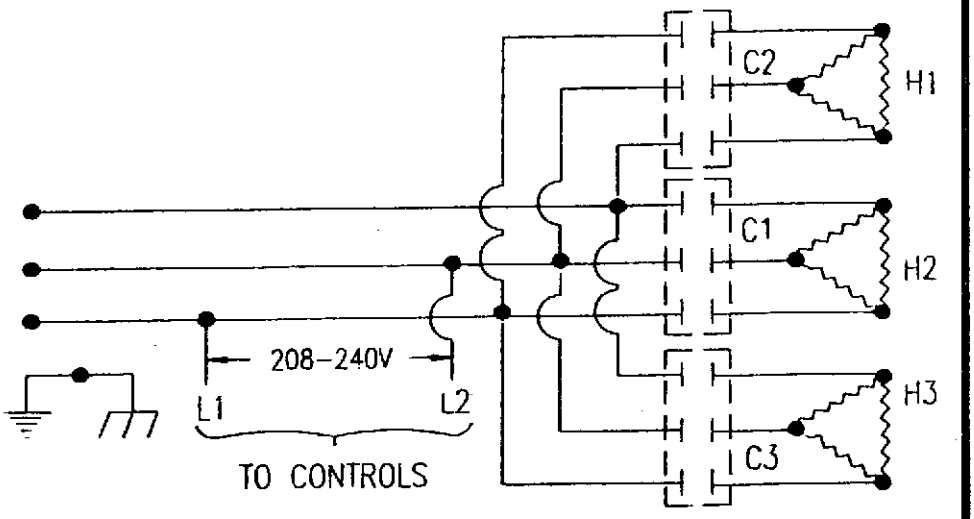
LEC-80, 220-240V, 3Φ
LEC-60, HEC-30 & 40
TWE-30 & 40
208-240V, 3Φ SUPPLY



LEC-60
HEC & TWE-30 & 40
208V, 3Φ SUPPLY



HEC & TWE-60 & 80
208-240V
3Φ SUPPLY



H = HEATER
C = CONTACTOR

NOTES:
1 - SEE E-409A FOR CONTROL SCHEMATIC
2 - GROUNDS ARE NOT APPLICABLE TO NAVAL SHIPBOARD KETTLES.

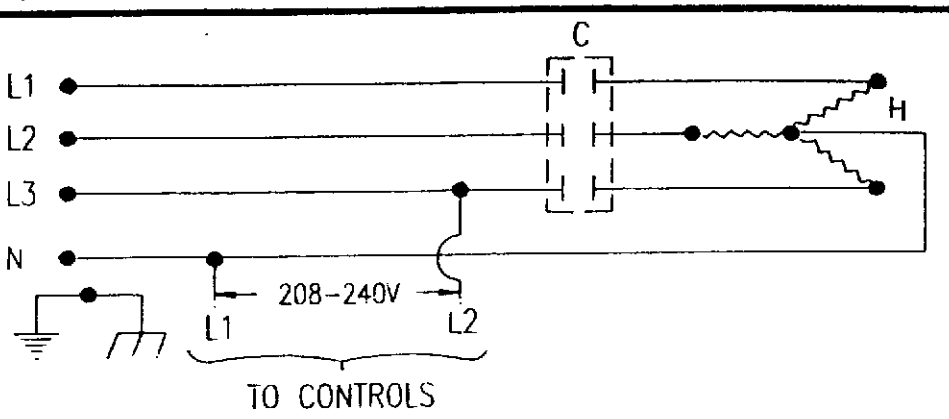
HEATER CIRCUITS, 208-240V, 3 PHASE
LEC, HEC, & TWE

REV.0 (2/21/90)

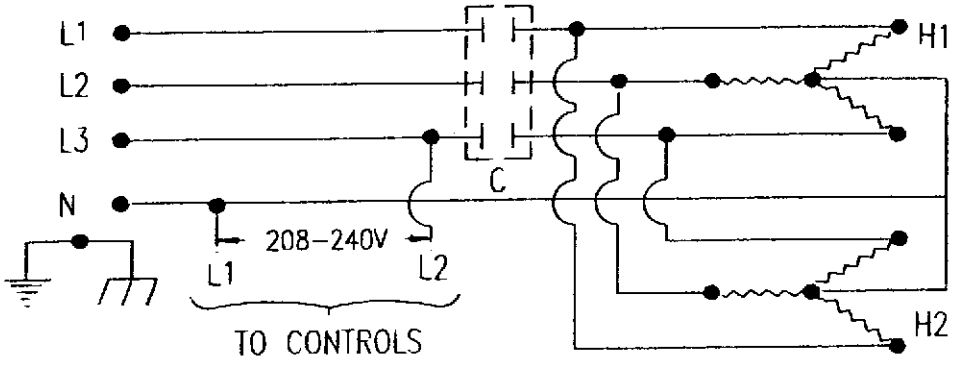
LEGION INDUSTRIES, INC.

E406A

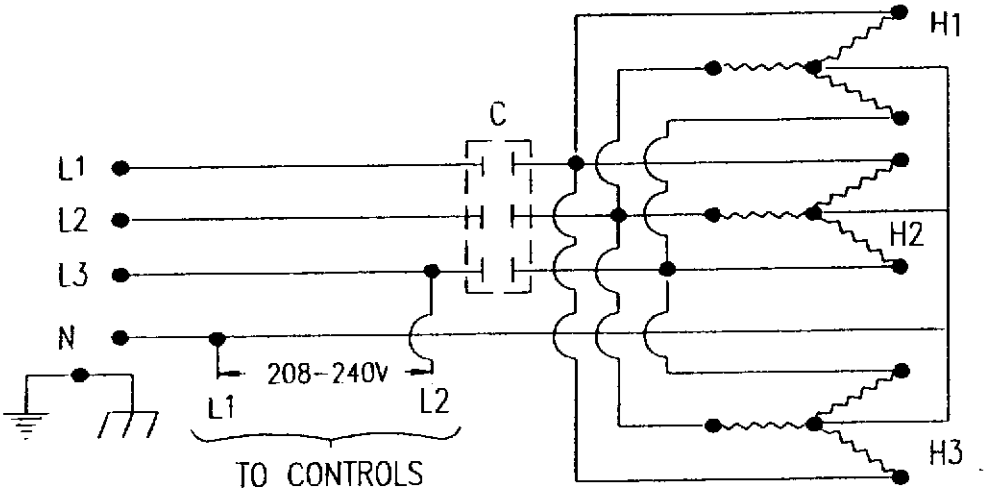
LEC-20,30, & 40
HEC & TWE-20
380-415V
3 Φ SUPPLY



LEC-60 & 80
HEC & TWE-30 & 40
380-415V, 3Φ
SUPPLY



HEC & TWE-60 & 80
380-415V
3Φ SUPPLY



H = HEATER
C = CONTACTOR

NOTES:
1 - SEE E-409A FOR CONTROL SCHEMATIC
2 - GROUNDS ARE NOT APPLICABLE TO NAVAL SHIPBOARD KETTLES.

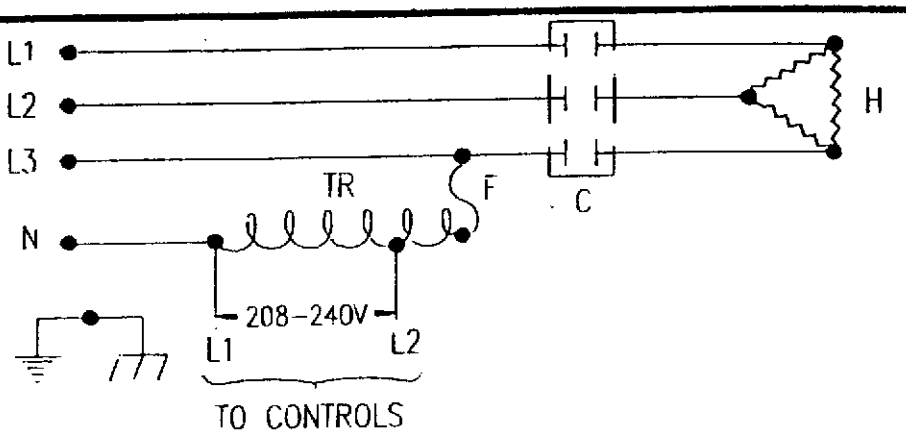
HEATER CIRCUITS, 380-415V, 3 PHASE
LEC, HEC, & TWE

REV.0 (2/21/90)

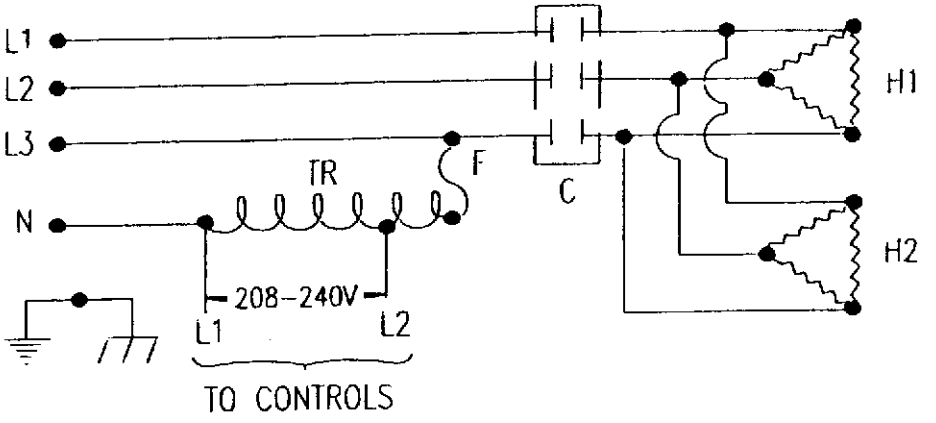
LEGION INDUSTRIES, INC.

E407A

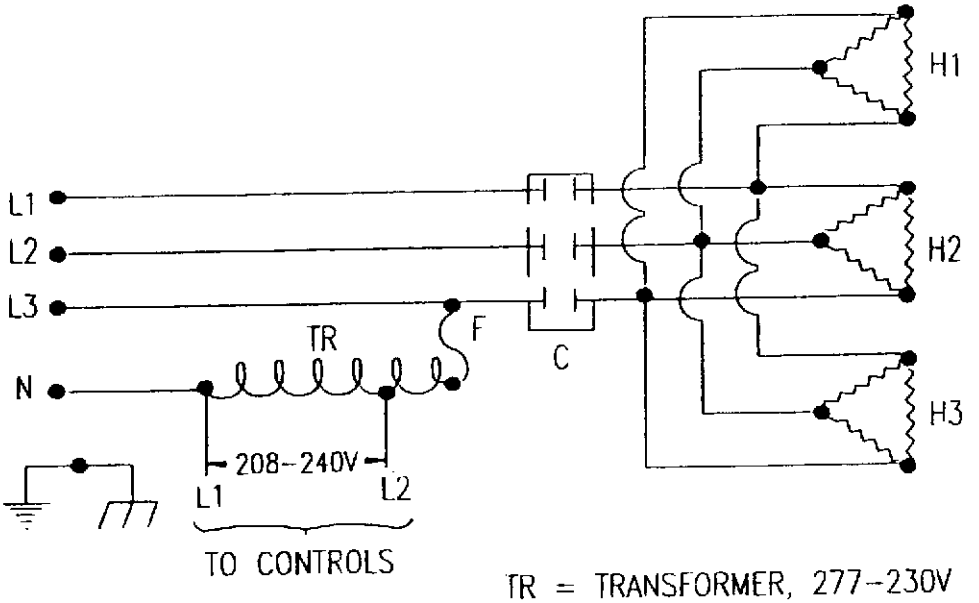
LEC-20,30, & 40
HEC & TWE-20
440-480V
3 Φ SUPPLY



LEC-60 & 80
HEC & TWE-30 & 40
440-480V
3Φ SUPPLY



HEC & TWE-60 & 80
440-480V
3Φ SUPPLY



TR = TRANSFORMER, 277-230V
F = FUSE
H = HEATER
C = CONTACTOR

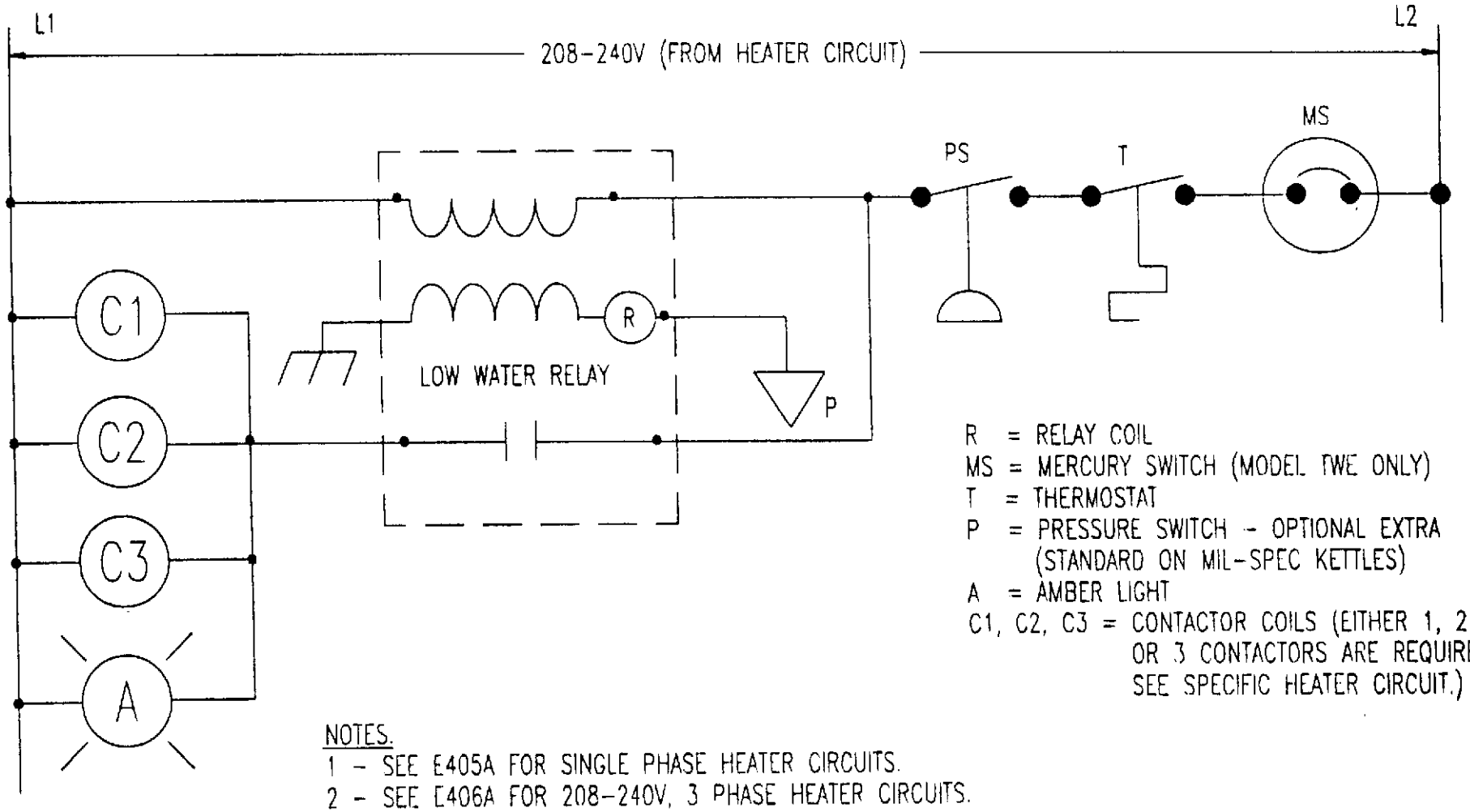
NOTES:
1 - SEE E-409A FOR CONTROL SCHEMATIC
2 - GROUNDS ARE NOT APPLICABLE TO NAVAL SHIPBOARD KETTLES.

HEATER CIRCUITS, 440-480V, 3 PHASE
LEC, HEC, & TWE

REV.0 (2/21/90)

LEGION INDUSTRIES, INC.

E408A



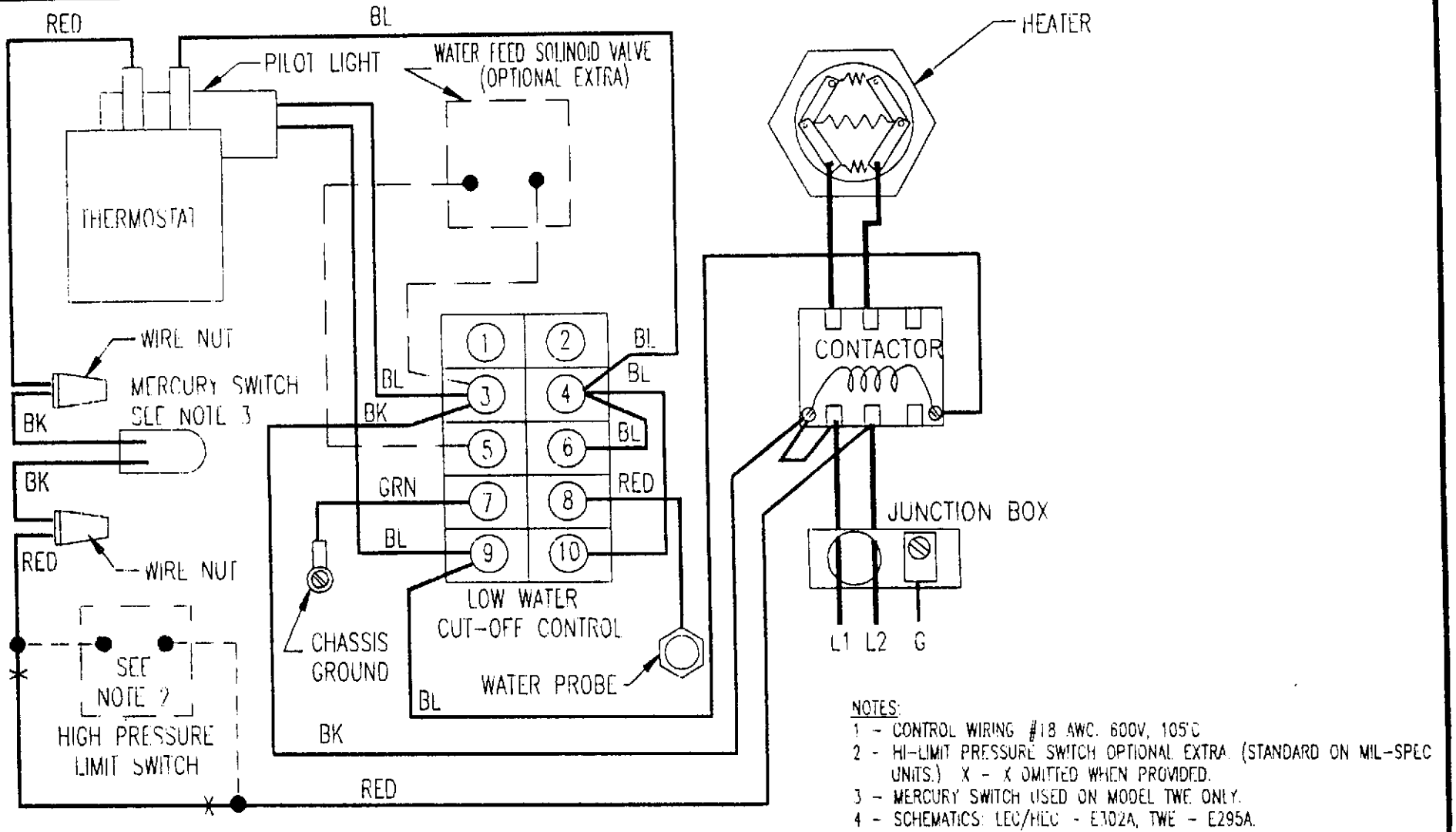
R = RELAY COIL
MS = MERCURY SWITCH (MODEL TWE ONLY)
T = THERMOSTAT
P = PRESSURE SWITCH - OPTIONAL EXTRA (STANDARD ON MIL-SPEC KETTLES)
A = AMBER LIGHT
C1, C2, C3 = CONTACTOR COILS (EITHER 1, 2, OR 3 CONTACTORS ARE REQUIRED SEE SPECIFIC HEATER CIRCUIT.)

NOTES.
1 - SEE E405A FOR SINGLE PHASE HEATER CIRCUITS.
2 - SEE E406A FOR 208-240V, 3 PHASE HEATER CIRCUITS.
3 - SEE E407A FOR 390-415V, 3 PHASE HEATER CIRCUITS.
4 - SEE E408A FOR 440-480V, 3 PHASE HEATER CIRCUITS.

CONTROL SCHEMATIC
LEC, HEC, & TWE

LEGION INDUSTRIES, INC.
E409A

DATE: 2/21/90
REV.
ECO.

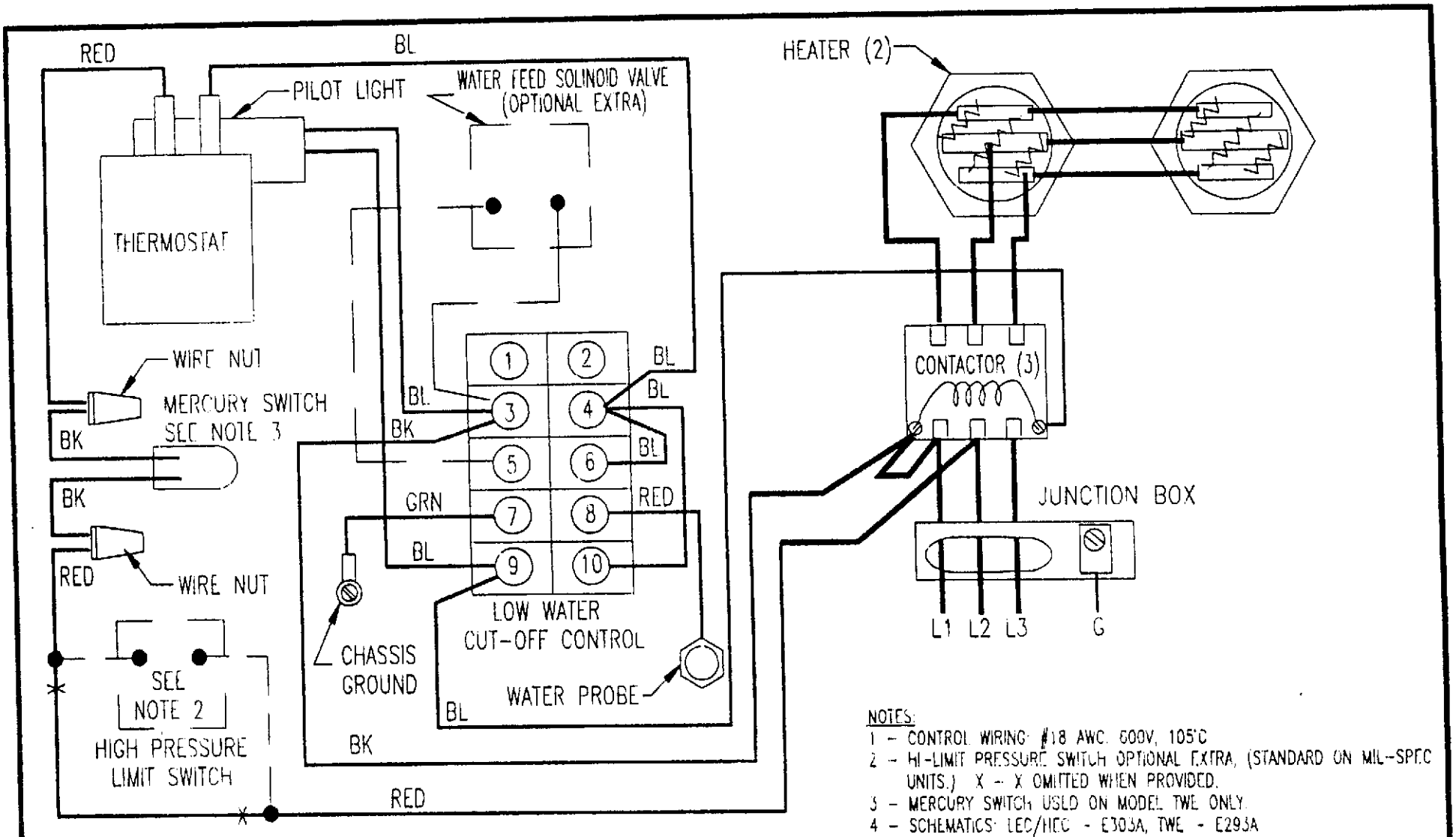


NOTES:
1 - CONTROL WIRING #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA. (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: LEC/HEC - E302A, TWE - E295A.

WIRING DIAGRAM,
LEC - 20, 30, & 40; HEC - 20 & TWE-20
208-240V, SINGLE PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E251A

DATE: 2/22/90
REV.
ECO.

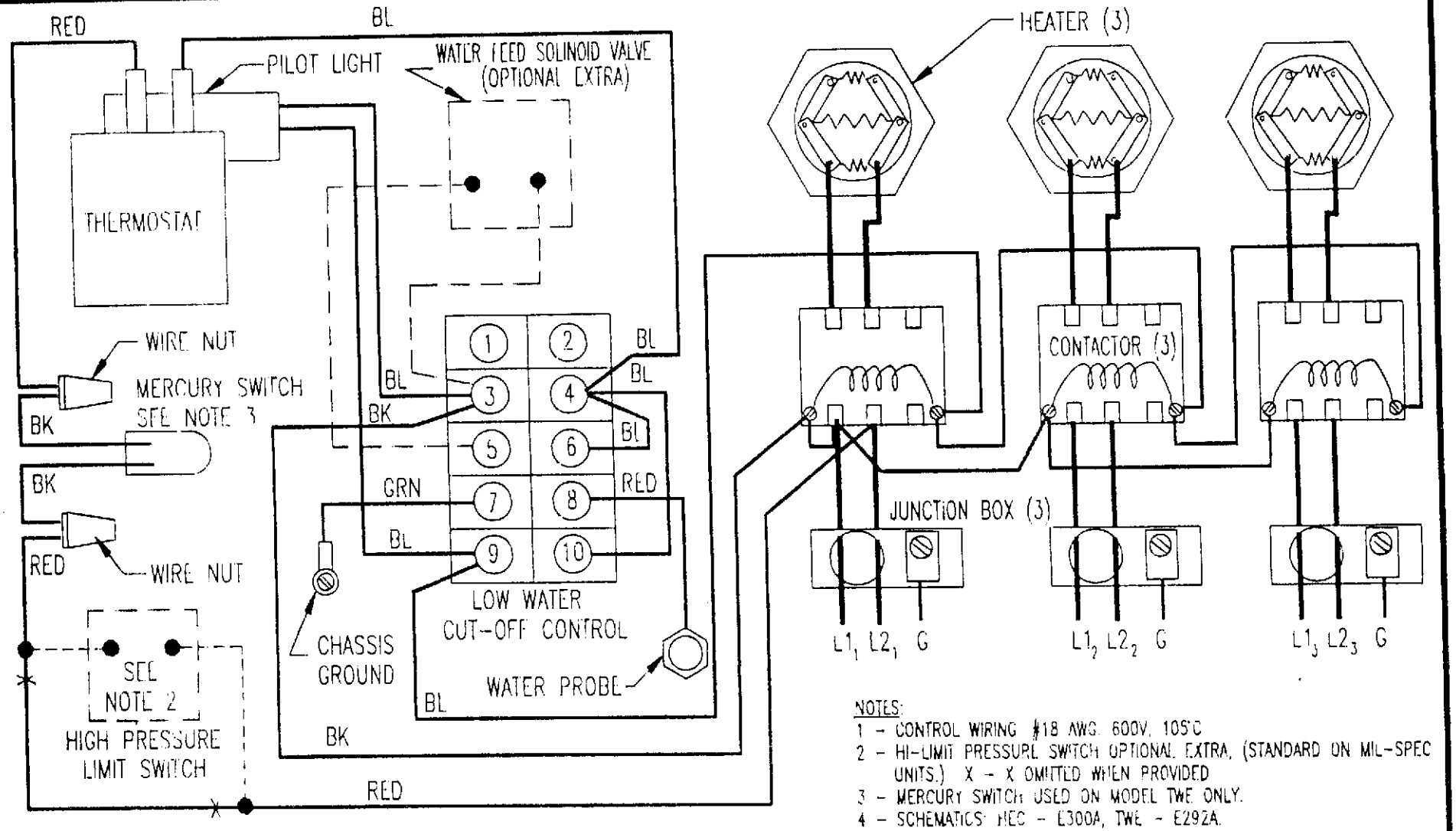


NOTES:
1 – CONTROL WIRING: #18 AWG. 600V, 105°C
2 – HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X – X OMITTED WHEN PROVIDED.
3 – MERCURY SWITCH USED ON MODEL TWE ONLY.
4 – SCHEMATICS: LEC/HEC - E303A, TWE - E293A

WIRING DIAGRAM,
HEC/TWE-30 & 40, LEC-60 @ 208-240V, 3 PHASE;
AND LEC-80 @ 220-240V, 3 PHASE ONLY
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E255-1A

DATE: 2/21/90
REV.
ECO.

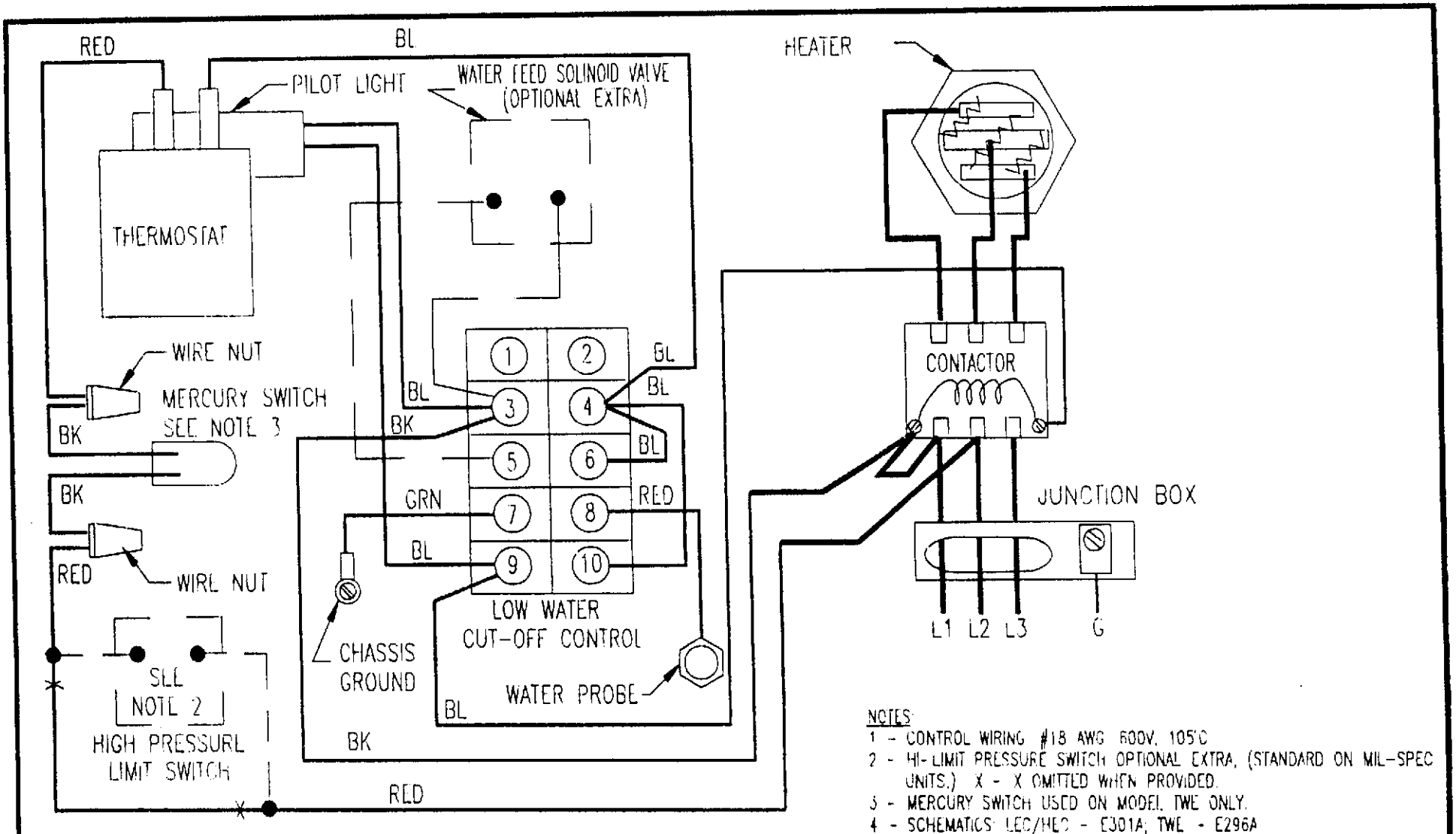


NOTES:
1 - CONTROL WIRING #18 AWG. 600V. 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA. (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: HEC - E300A, TWE - E292A.

WIRING DIAGRAM.
HEC/TWE - 60 & 80
208-240V, SINGLE PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION
LEGION INDUSTRIES, INC.
E255-2A

DATE. 2/21/90
REV.
ECO

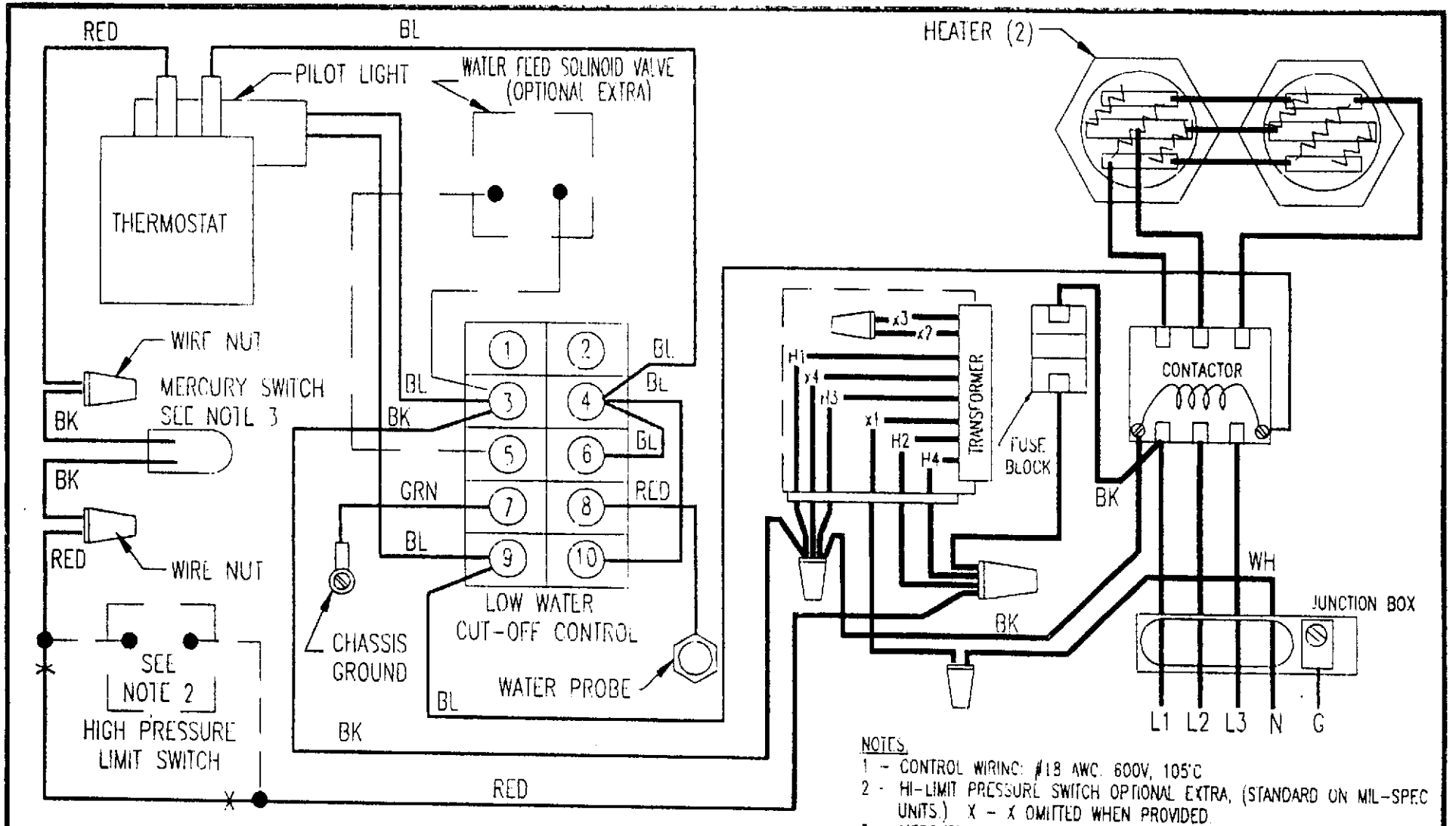


NOTES:
1 - CONTROL WIRING #18 AWG 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: LEC/HEC - E301A; TWE - E296A

WIRING DIAGRAM,
LEC-20, 30, & 40; HEC-20 & TWE-20
208-240V. 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E256A

DATE: 2/21/90
REV.
ECO

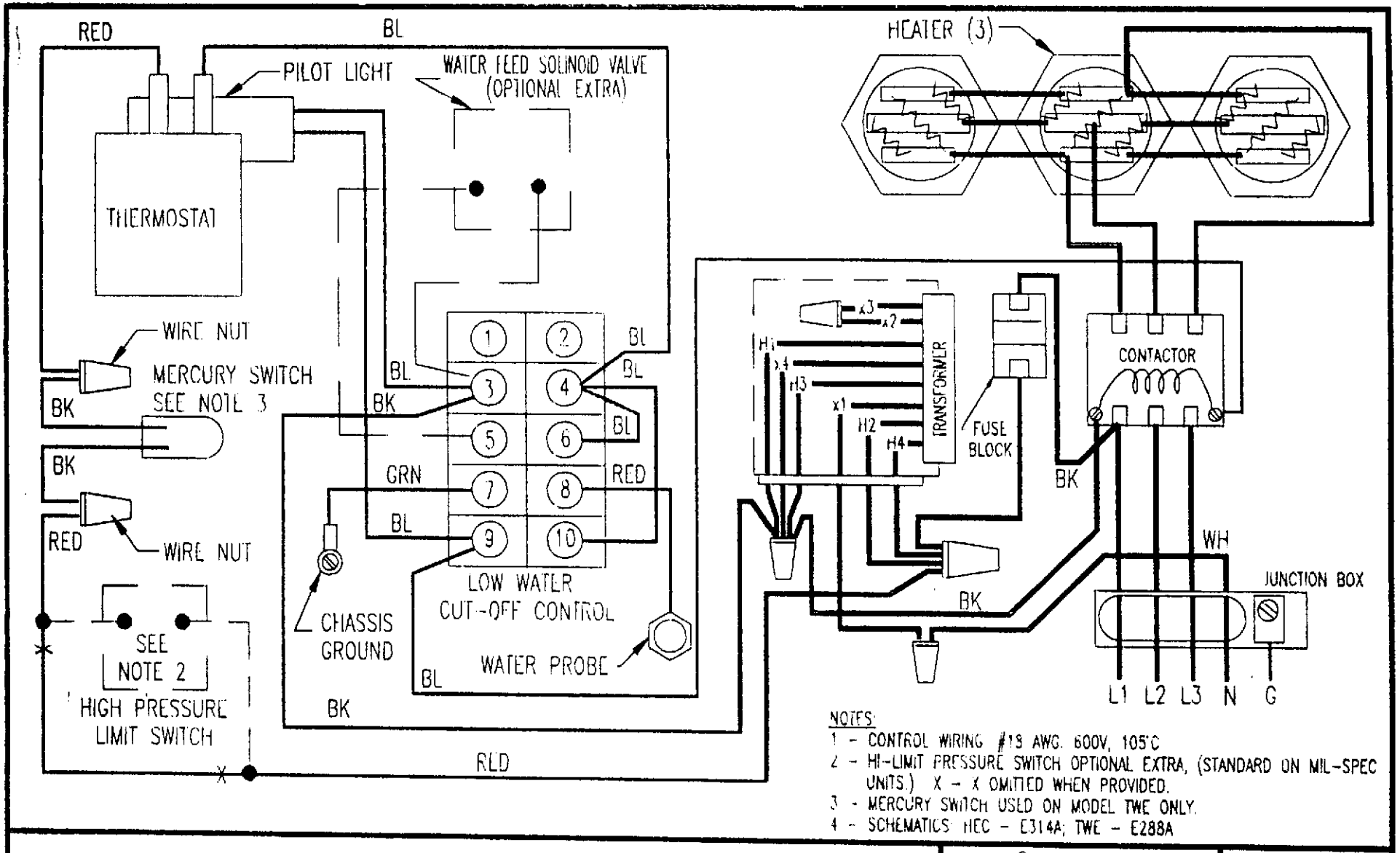


NOTES:
1 - CONTROL WIRING: #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: LEC/HEC - E298A; TWE - E290A

WIRING DIAGRAM,
LEC-60 & 80, HEC/TWE-30 & 40
480V, 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E257A

DATE. 2/21/90
REV. 7
ECO. 1347



NOTES:
1 - CONTROL WIRING #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: HEC - E314A; TWE - E288A

WIRING DIAGRAM,
HEC/TWE - 60 & 80
480V, 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

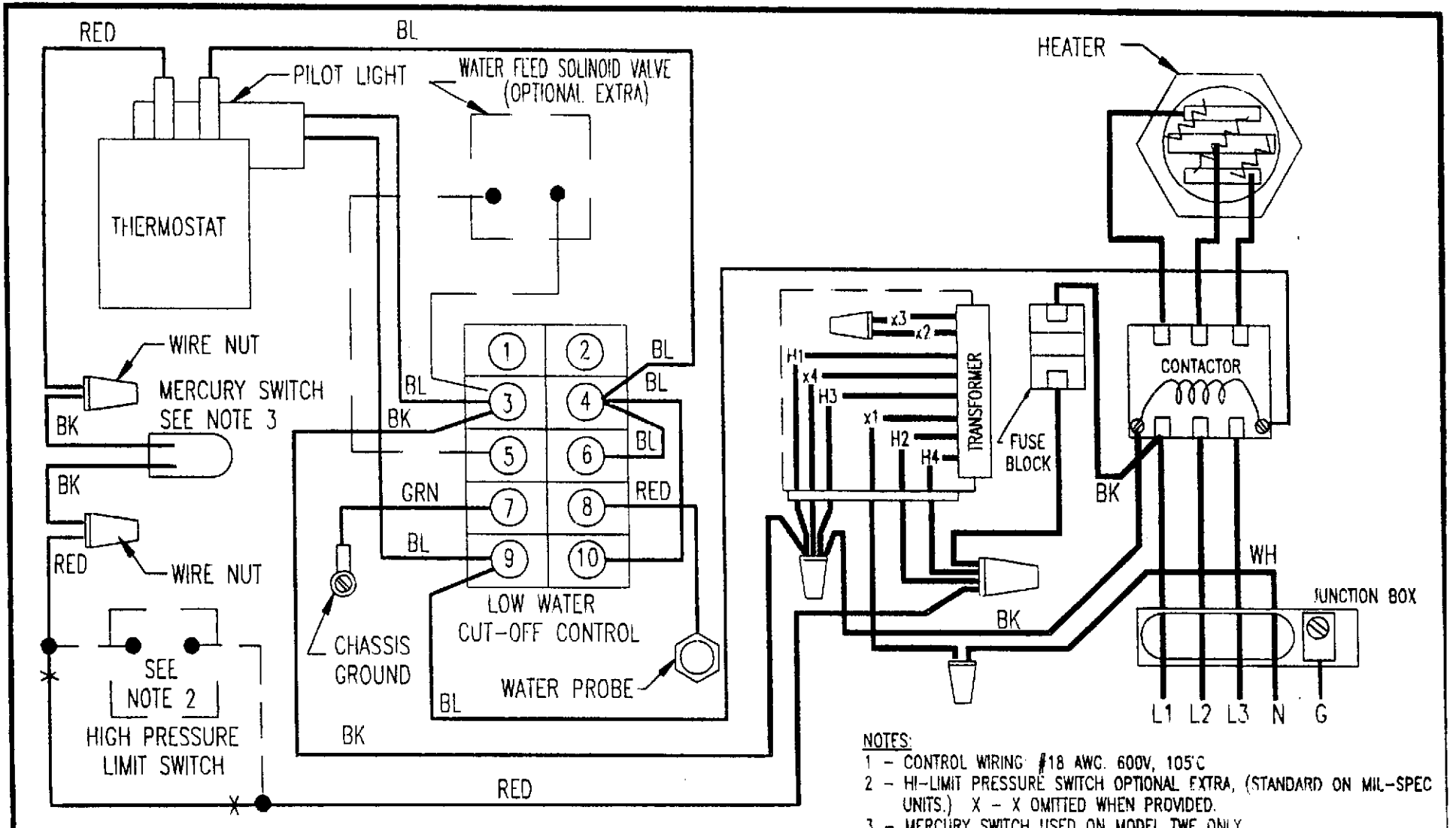
LEGION INDUSTRIES, INC.

E258A

DATE: 2/21/90

REV. 7

ECO 1347

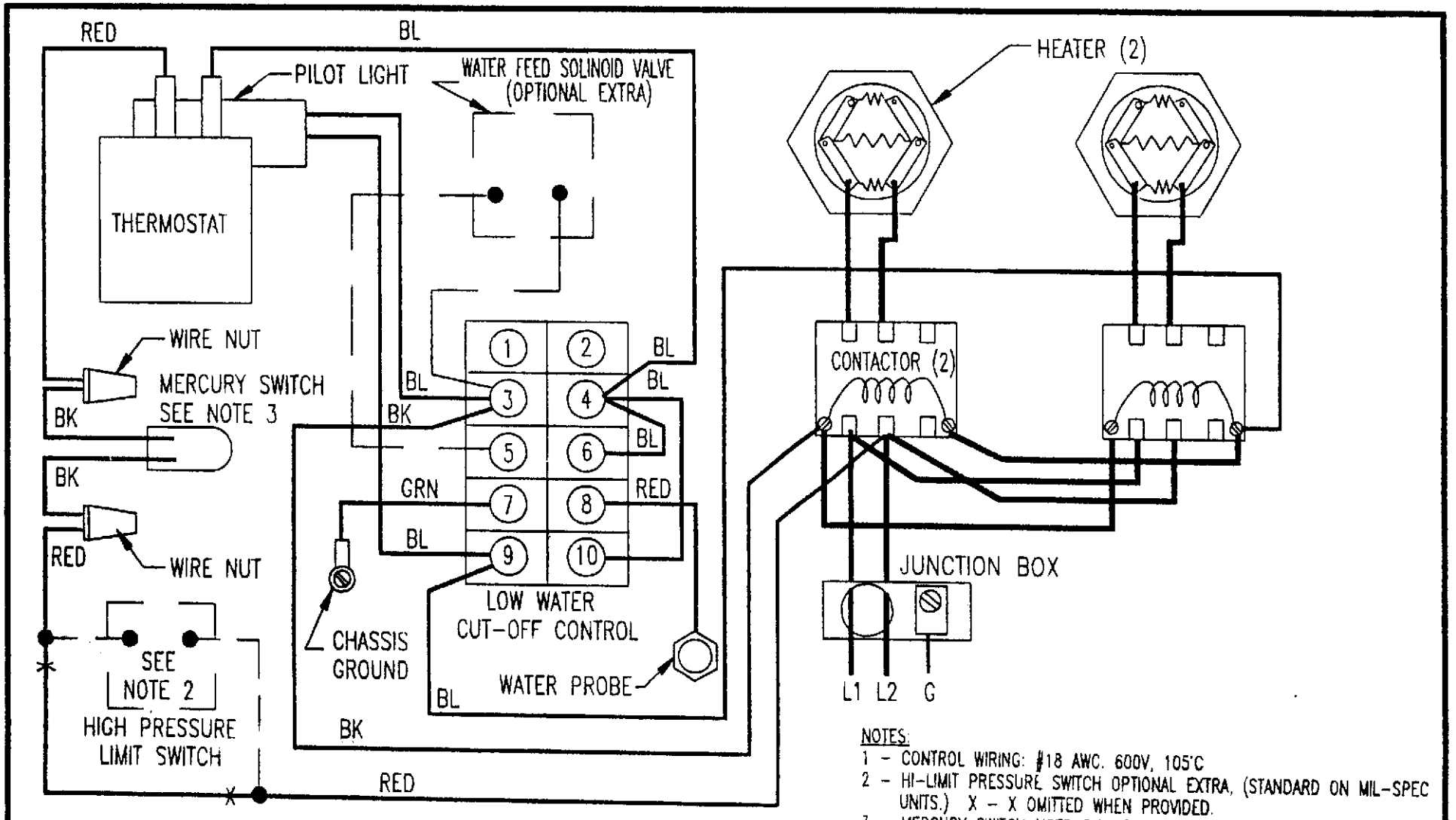


NOTES:
1 – CONTROL WIRING #18 AWG. 600V, 105°C
2 – HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X – X OMITTED WHEN PROVIDED.
3 – MERCURY SWITCH USED ON MODEL TWE ONLY
4 – SCHEMATICS: LEC/HEC – E297A; TWE – E289A.

WIRING DIAGRAM,
LEC-20, 30, & 40, HEC-20 & TWE-20
480V, 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E259A

DATE: 2/21/90
REV. 7
ECO. 1347

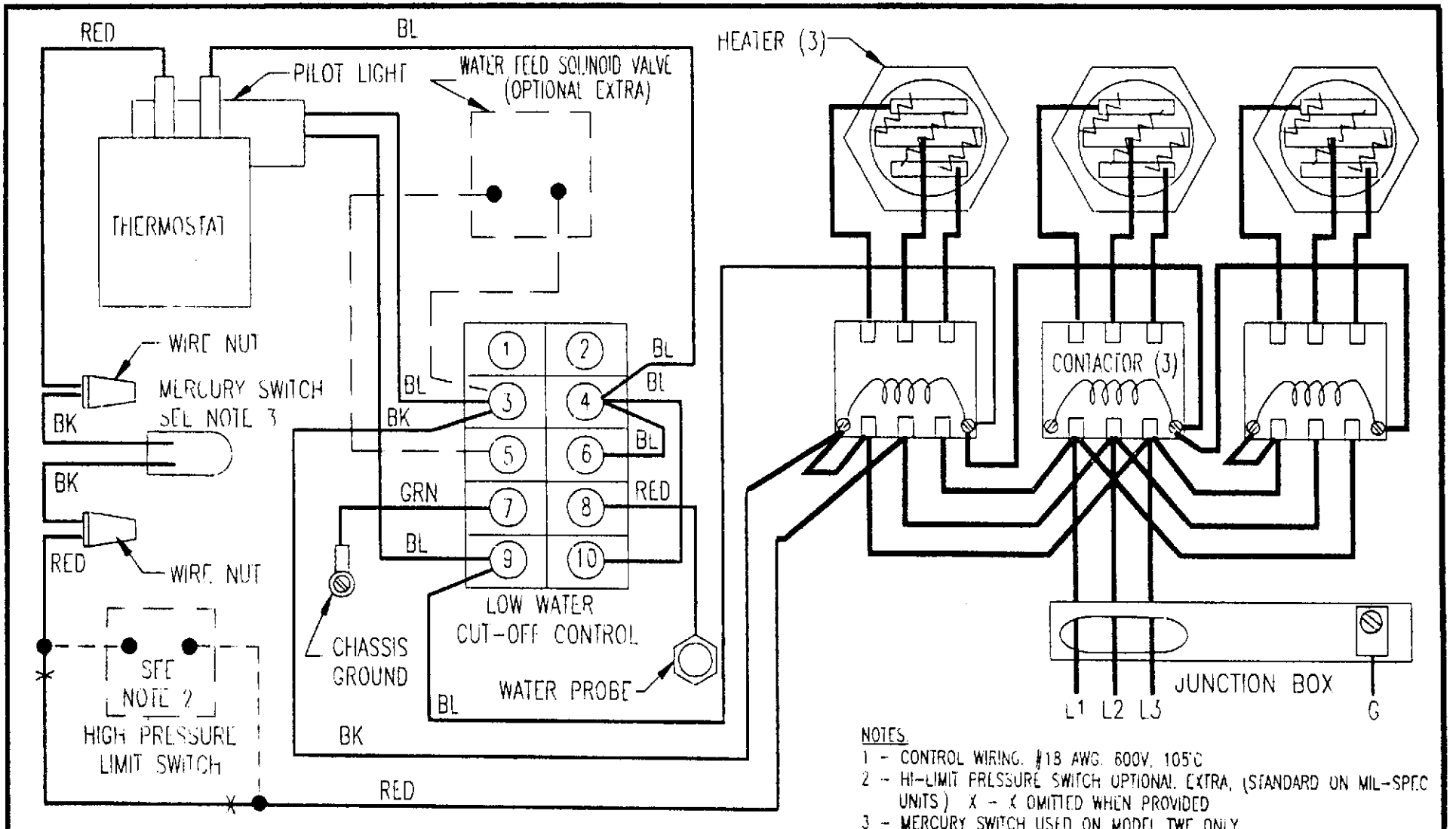


NOTES:
1 - CONTROL WIRING: #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: LEC/HEC - 304A; TWE - E294A

WIRING DIAGRAM,
LEC-60, HEC/TWE-30 & 40
220-240V, SINGLE PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E260A

DATE: 2/22/90
REV.
ECO.



NOTES

1 - CONTROL WIRING. #18 AWG. 600V. 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS) X - X OMITTED WHEN PROVIDED
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: HEC - E293A; TWE - 291A.

WIRING DIAGRAM,
HEC/TWE - 60 & 80
208-240V, 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

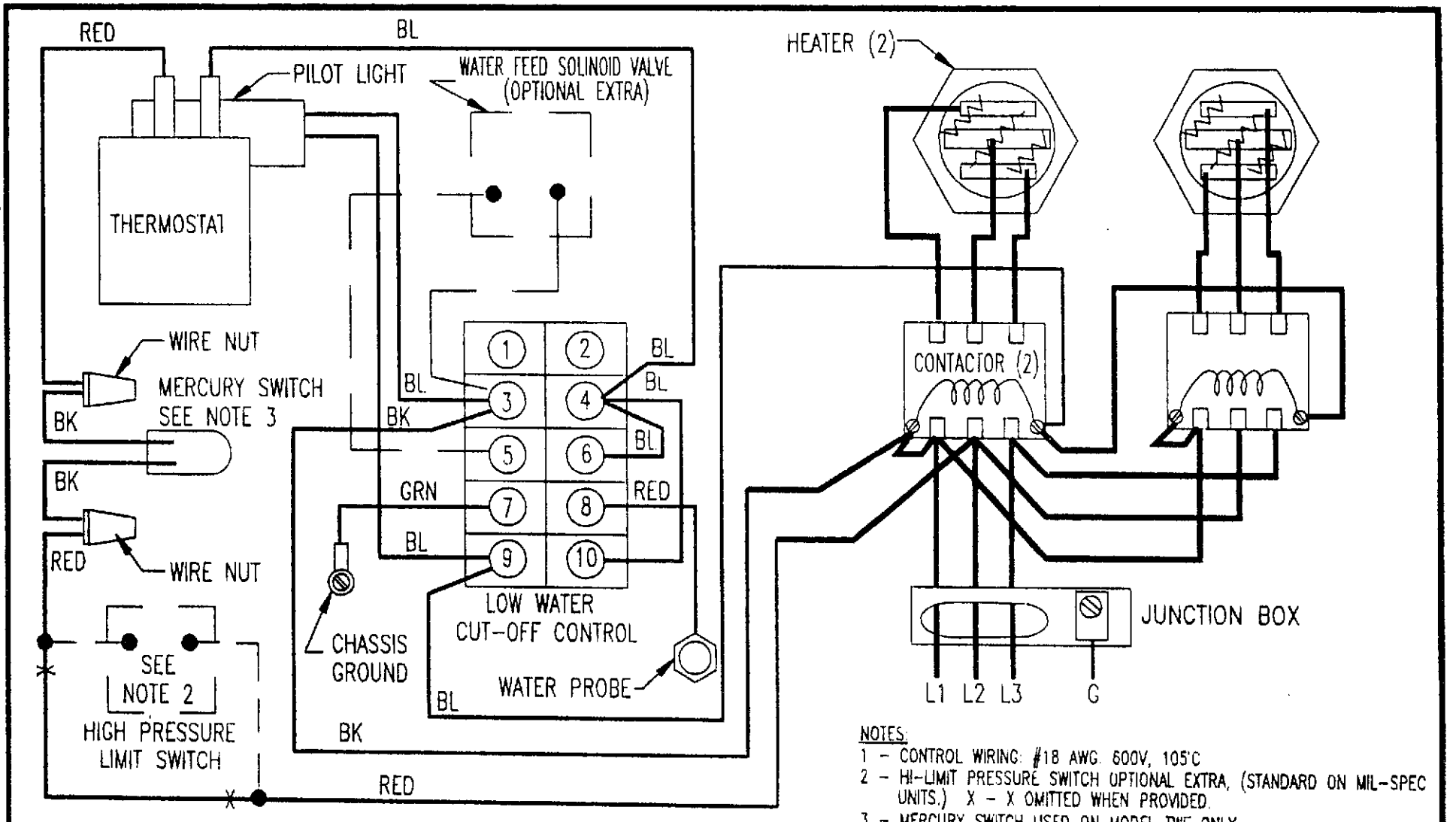
LEGION INDUSTRIES, INC.

E273A

DATE: 2/21/90

REV.

ECO.



NOTES:

1 - CONTROL WIRING: #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATIC: LEC-80 208V, 3 PH - E326A

WIRING DIAGRAM,
LEC-80
208V, 3 PHASE
W/ BW 1500D LOW WATER CUT-OFF

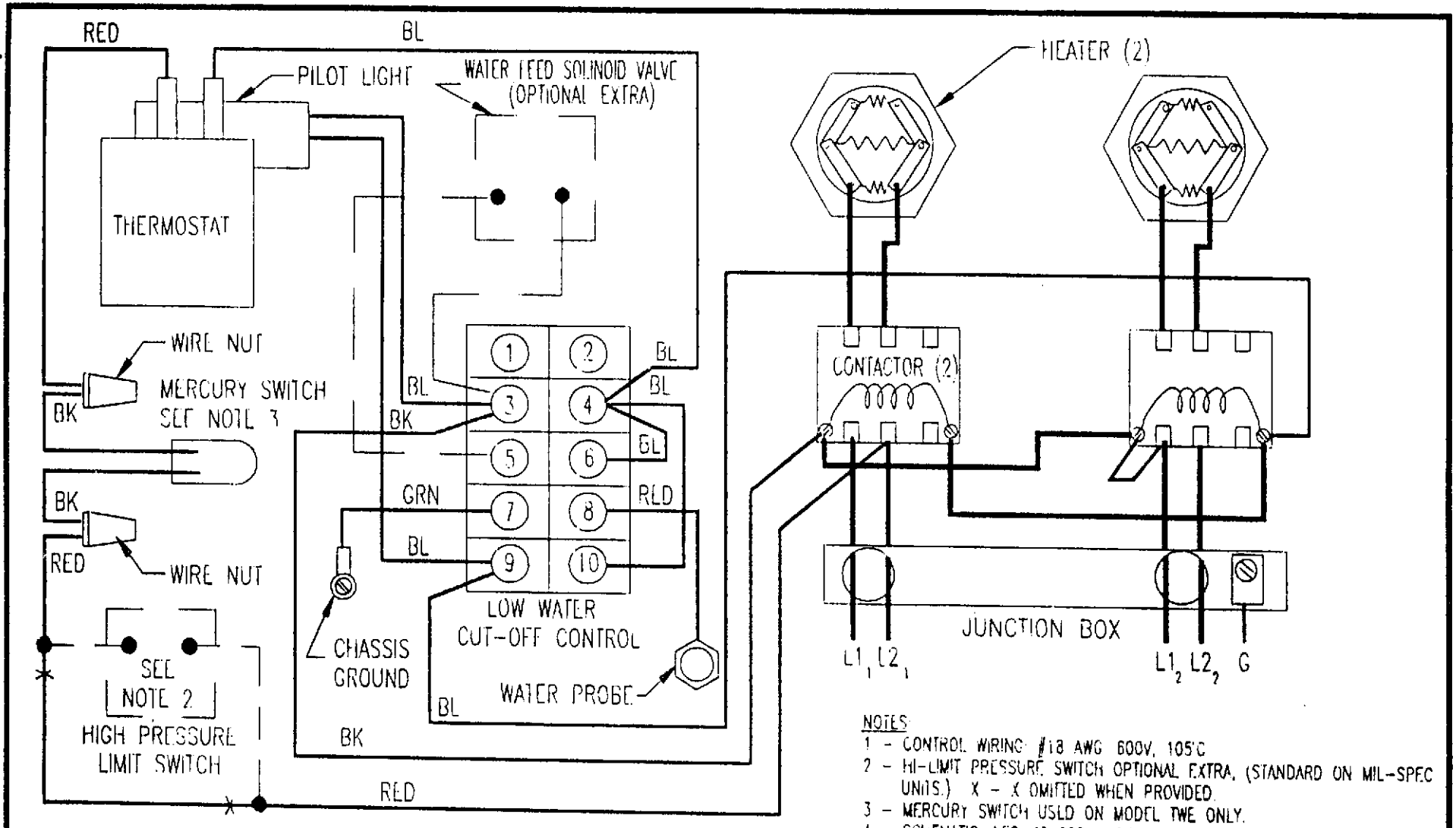
LEGION INDUSTRIES, INC.

E321A

DATE: 2/21/90

REV. 2

ECO. 1347

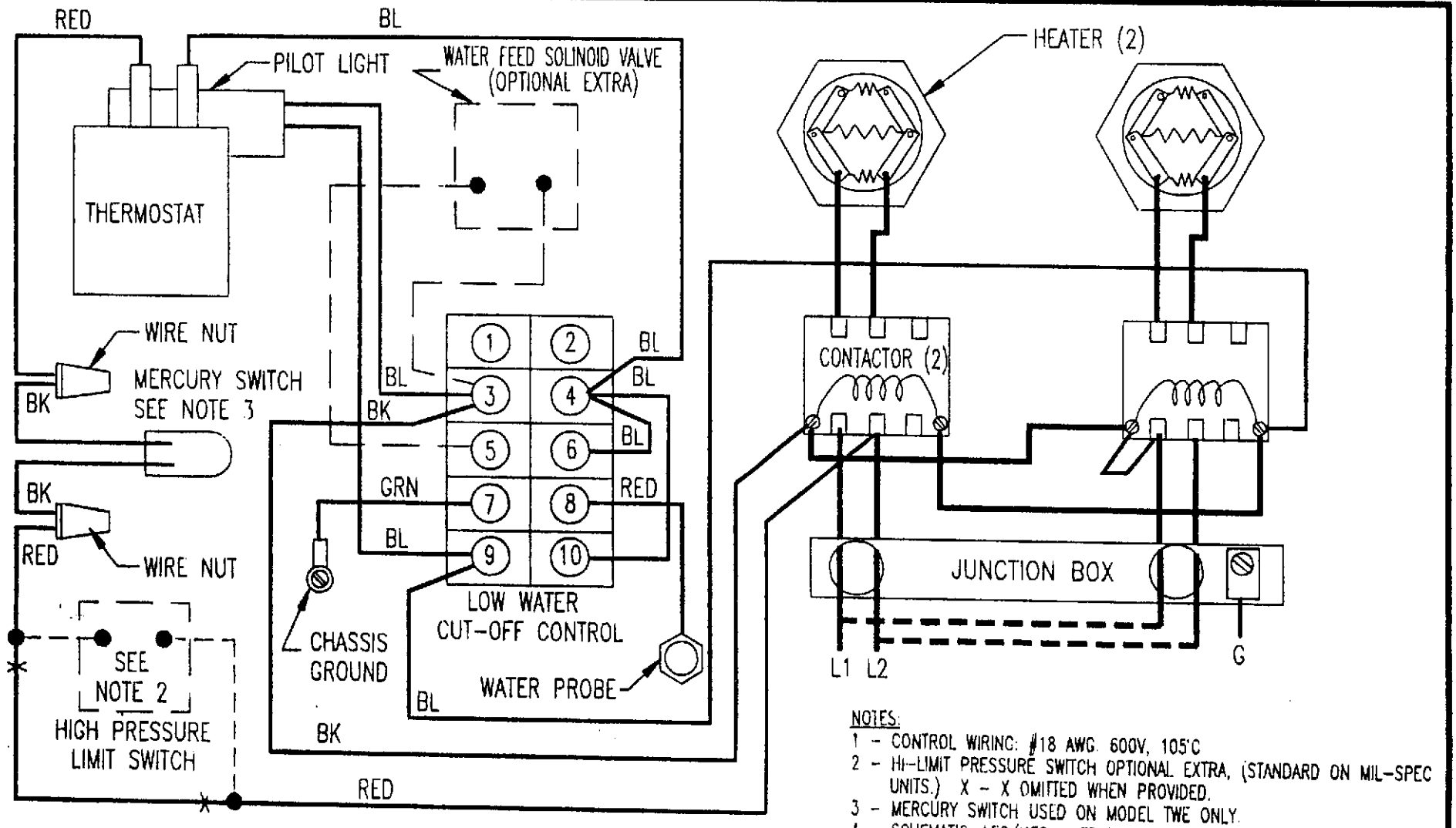


NOTES:
1 - CONTROL WIRING #18 AWG 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA. (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATIC: LEC-80 208-240V, 1 PH - E344A.

WIRING DIAGRAM,
LEC-80
208-240V, SINGLE PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION INDUSTRIES, INC.
E335A

DATE: 2/22/90
REV. 2
ECO. 1347

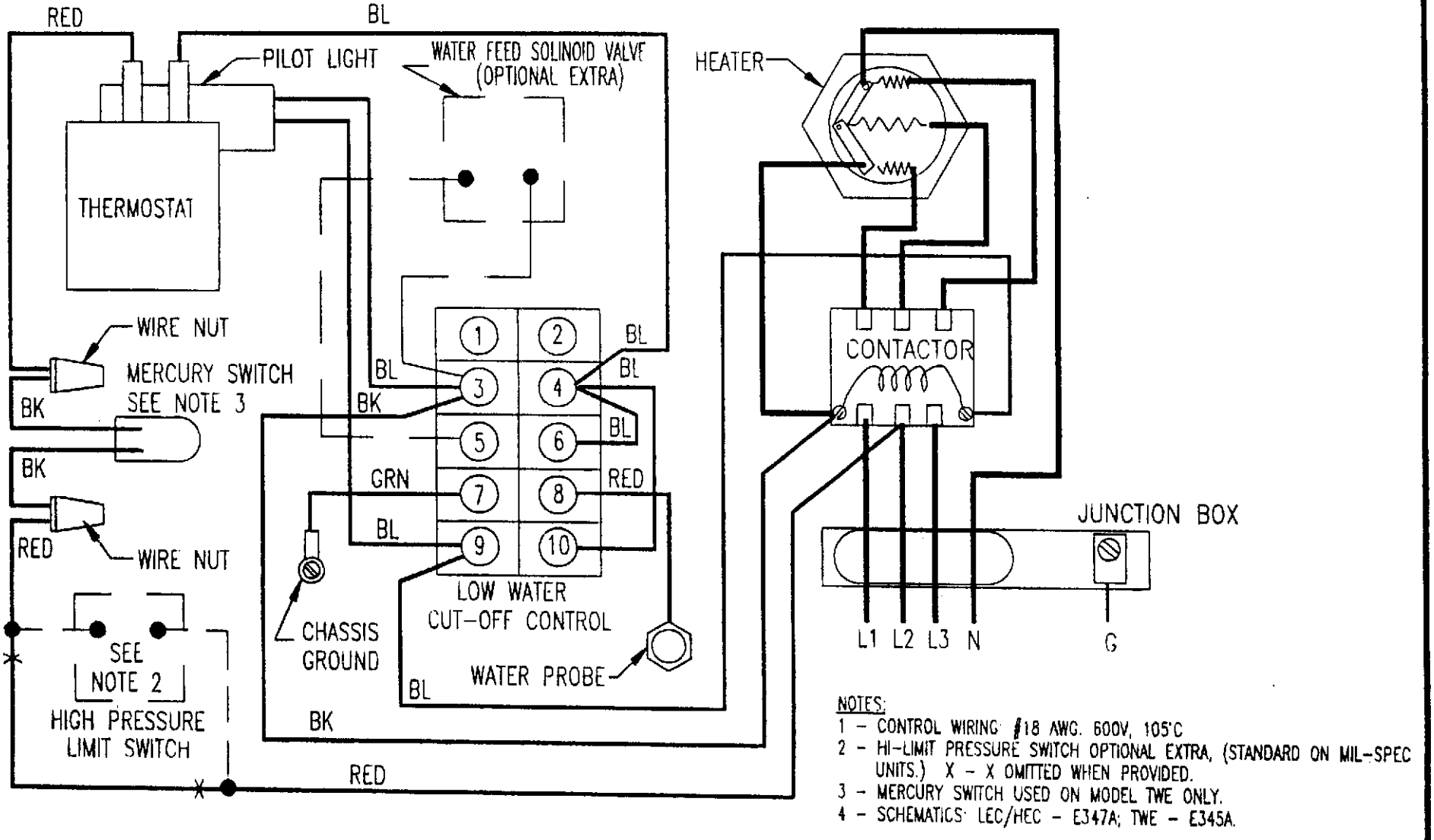


NOTES:
1 - CONTROL WIRING: #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATIC: LEC/HEC - E343A; TWE - E342A.

WIRING DIAGRAM,
LEC-60; HEC/TWE-30 & 40
208-240V, SINGLE PHASE
W/ BW 1500D LOW WATER CUT-OFF

LEGION
LEGION INDUSTRIES, INC.
E341A

DATE: 2/22/90
REV. 2
ECO. 1347

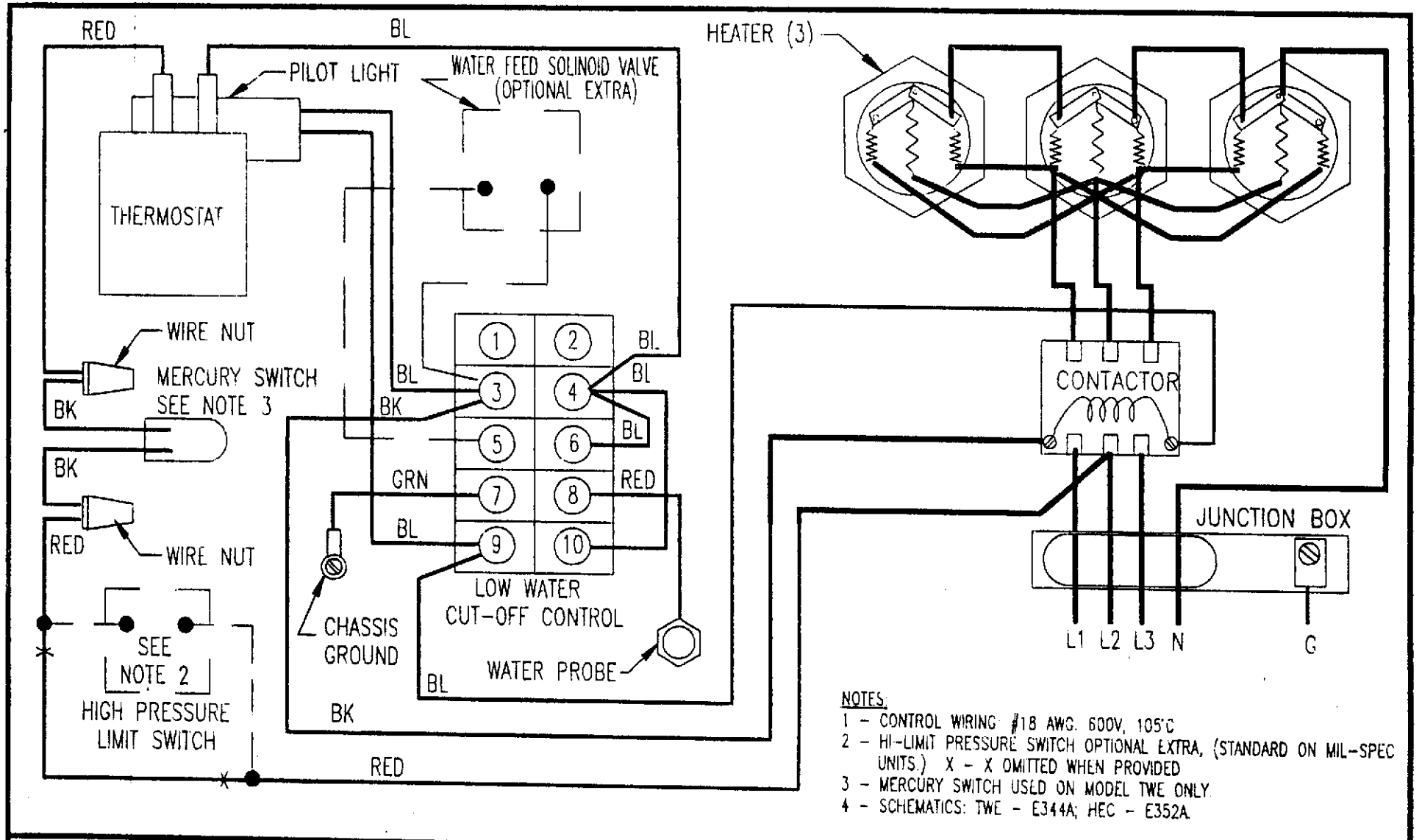


NOTES:
1 - CONTROL WIRING #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: LEC/HEC - E347A; TWE - E345A.

WIRING DIAGRAM,
LEC-20, 30, & 40, HEC-20 & TWE-20
380-415V, 3 PHASE; WYE - 4 WIRE
W/ BW 1500D LOW WATER CUT-OFF

LEGION
LEGION INDUSTRIES, INC.
E372A

DATE: 2/22/90
REV. 2
ECO. 1347

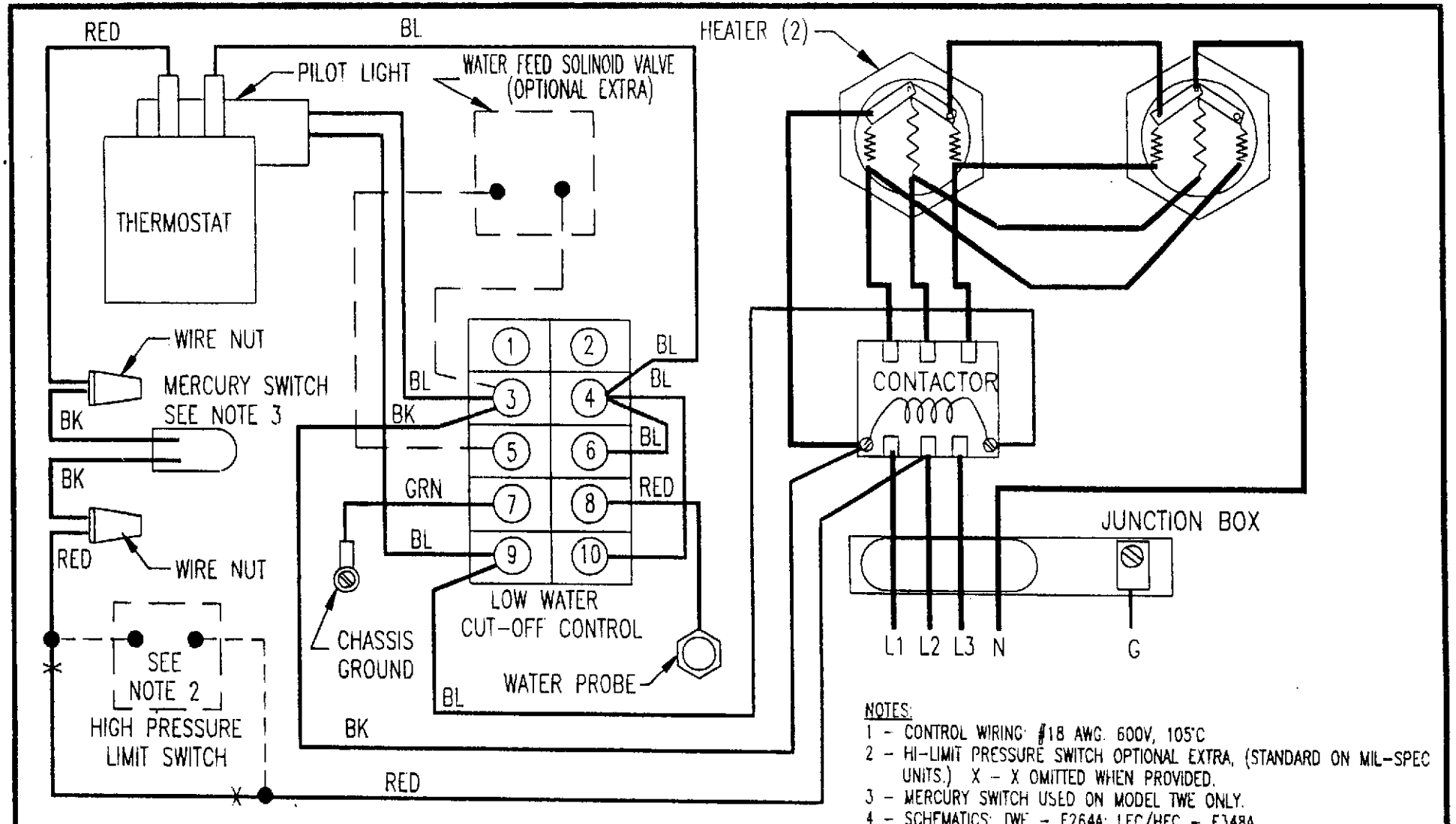


NOTES.
1 – CONTROL WIRING #18 AWG. 600V, 105°C
2 – HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X – X OMITTED WHEN PROVIDED
3 – MERCURY SWITCH USED ON MODEL TWE ONLY
4 – SCHEMATICS: TWE – E344A; HEC – E352A

WIRING DIAGRAM,
TWE/HEC–60 & 80
380–415V, 3 PHASE; WYE – 4 WIRE
W/ BW 1500D LOW WATER CUT-OFF

LEGION
LEGION INDUSTRIES, INC.
E373A

DATE: 2/22/90
REV. 2
ECO. 1347



NOTES:
1 - CONTROL WIRING: #18 AWG. 600V, 105°C
2 - HI-LIMIT PRESSURE SWITCH OPTIONAL EXTRA, (STANDARD ON MIL-SPEC UNITS.) X - X OMITTED WHEN PROVIDED.
3 - MERCURY SWITCH USED ON MODEL TWE ONLY.
4 - SCHEMATICS: TWE - E264A; LEC/HEC - E348A.

WIRING DIAGRAM,
TWE/HEC-30 & 40; LEC-80
380-415V, 3 PHASE; WYE - 4 WIRE
W/ BW 1500D LOW WATER CUT-OFF

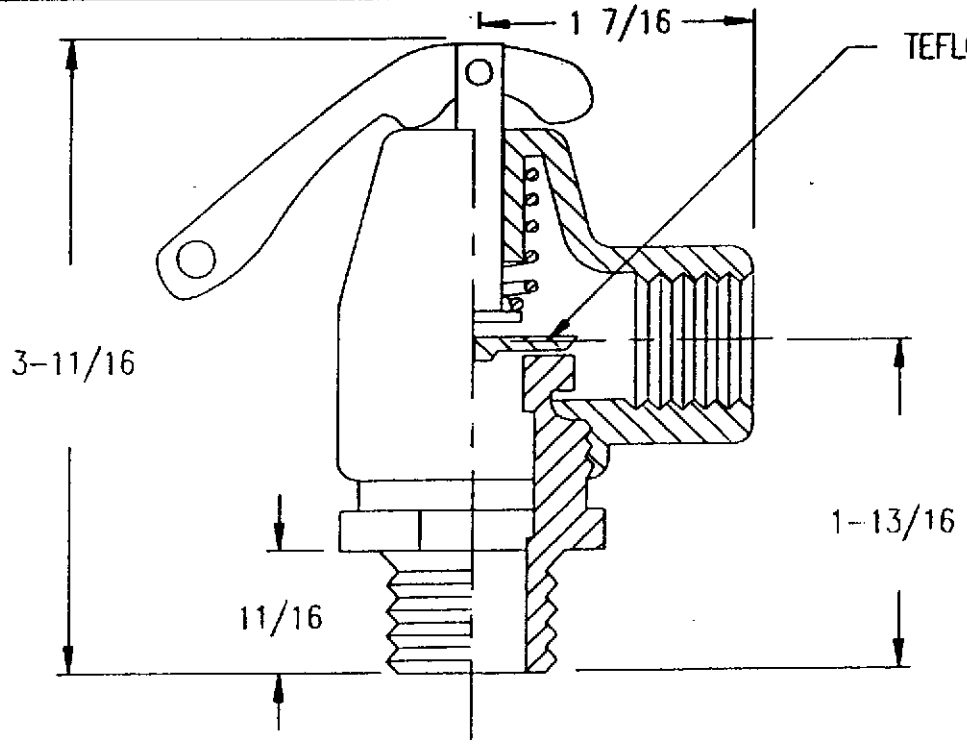
LEGION INDUSTRIES, INC.

E374A

DATE: 2/22/90

REV. 2

ECO. 1347



CAT. NO.	SETTING	APPLICATION	STYLE	SIZE	DISCHARGE		WT. EA. (LBS.)
					AREA SQ. IN.	CAPACITY LBS. @ 15 LBS.	
440168	30	STANDARD					
440171	40	STANDARD					
440170	35	STANDARD					1 LB.
440173	55	MIL-K-22565	10.301	3/4" X 3/4"	.500	446	
440172	45	SPECIAL					

All safety valves used by Legion Industries, Inc., are A.S.M.E. rated, sealed, and stamped for a specific discharge pressure as indicated above.

Safety valves are not to be tampered with, and should not be repaired in the field. If they operate improperly, they should be returned to the factory.

Safety valves may be used as air release devices, although this is not necessarily recommended. The safety valve functions as an air release by lifting the lever.

The Legion safety valve has teflon faced seat discs which have proven to be much superior to metal seating. Hissing or bleeding of safety valve can be caused by dirt particles being lodged between the seat and the disc. To blow out a safety valve, trip release lever. Use long bladed screw driver for lifting, withdraw the blade abruptly so that the valve will close shut, and repeat until the hissing has disappeared. If a safety valve continues to hiss and bleed before blow-off pressure has been reached, the seat, or disc is defective and the valve must be replaced.

Safety valves have an allowable tolerance of 10% of the pressure for which they are set. Hissing and bleeding within the tolerance range before full pop-off and shut-down is normal.

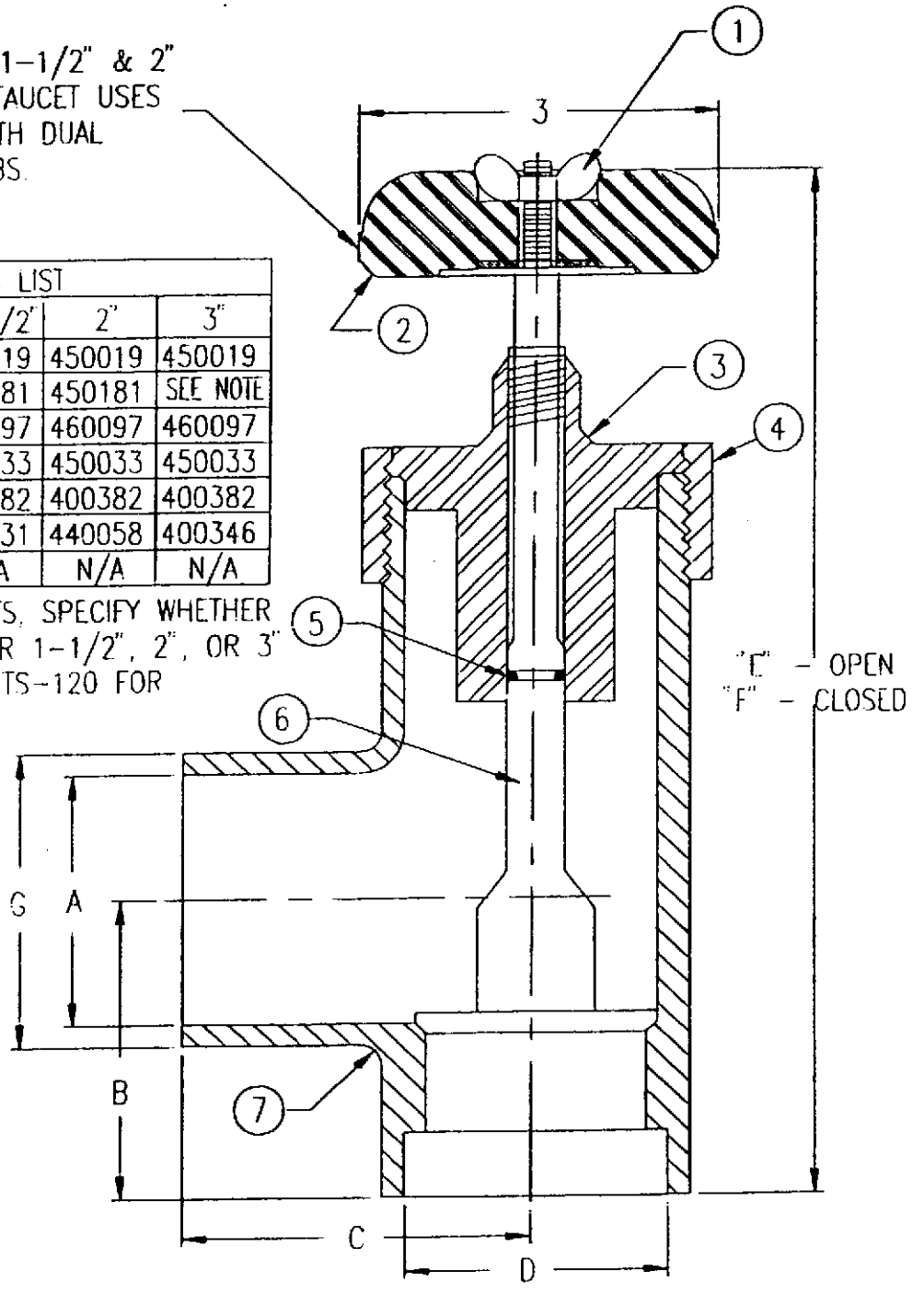
LEGION INDUSTRIES, INC. A.S.M.E. CODED SAFETY VALVE
STYLE 10.301 WITH TEFLON SEAT DISC - CHROMEPLATED

LEGION INDUSTRIES, INC.
TS-116A

HANDLE SHOWN FOR 1-1/2" & 2" FAUCETS ONLY. 3" FAUCET USES BAR TYPE HANDLE WITH DUAL HEAT RESISTANT KNOBS.

PARTS LIST				
	FAUCET SIZE	1-1/2"	2"	3"
1	WING NUT	450019	450019	450019
2	HANDLE	450181	450181	SEE NOTE
3	FAUCET GLAND	460097	460097	460097
4	BONNET NUT	450033	450033	450033
5	O-RING	400382	400382	400382
6	STEM	440131	440058	400346
7	BODY	N/A	N/A	N/A

WHEN ORDERING PARTS, SPECIFY WHETHER THEY ARE WANTED FOR 1-1/2", 2", OR 3" SIZE. SEE BULLETIN TS-120 FOR INSTALLATION.



SIZE	CAT. NO.	A	B	C	D	E	F	G
1-1/2"	440057	1-3/8"	2"	2-1/2"	1-1/2"	7-1/2"	6-1/2"	1-21/32"
2"	440019	1-7/8"	2-15/16"	3-1/8"	2"	10-1/4"	8-1/16"	2-7/32"
3"	440235	2-7/8"	3-7/16"	4"	3"	13-3/4"	10-7/8"	3-3/8"

FAUCET, STANDARD 1-1/2", 2" AND 3" DAIRY
METAL COMPRESSION TYPE TANGENT
STEAM KETTLE DRAW-OFF

LEGION INDUSTRIES, INC.

TS-117A

In order to install a new faucet of the plug or compression type, remove all parts from the faucet leaving only the faucet body on the draw-off tube.

1. Heat up solder joints in rear of the faucet with a blow torch (Benz O Matic) until the solder starts dripping. Tap faucet body gently from the rear while welding; use a rubber mallet or a piece of wood and make sure the faucet is not allowed to drop.

2. After the faucet body has been removed, add acid (Silvaloy Ultra Flux) to the draw-off tube. Heat it slightly and add solder for retinning. Wipe off excess solder so that the draw-off tube is completely tinned and smooth.

3. To install new faucet, likewise remove all inner parts and handles and brush some acid on the recessed seating opening in the back of the faucet and add solder. Wipe inside clean so that the entire recessed bore is tinned. This coat of tin must be very thin and care must be taken that neither acid nor tin find their way into the valve body.

4. Now, brush acid on the faucet and draw-off tube and slip faucet body gently onto draw-off tube making sure that the body bottoms on the draw-off tube.

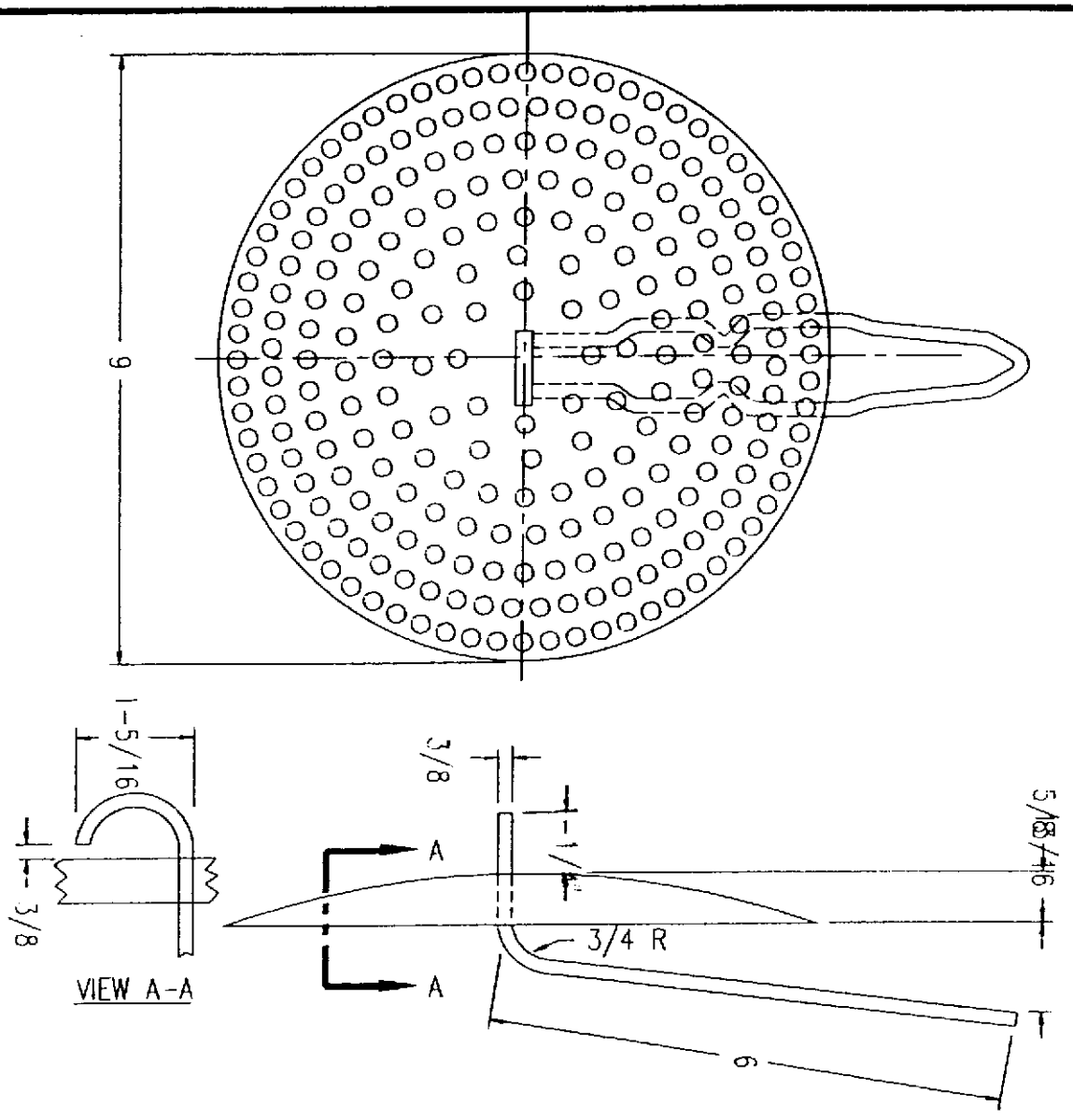
5. Apply the blow torch and heat slightly all around. Add solder while heating. Very little solder is needed. If too much solder is applied, it will enter into the valve seat region and this must be avoided. When finished, cool water and wash clean. Use type BAg-5 (45% silver, 30% copper, 25% zinc) solder per Federal Specification QQ-B-654, Grade I. (Silvaloy A45).

6. It is helpful to tilt the kettle forward so that the draw-off tube is close to a vertical position. However, this is not absolutely necessary if the mechanic is skilled in soldering procedures.

For detailed dimensions of draw-off faucets, refer to:

Drawing TS-117A SH.1	Dairy metal 1½" (#440057) and 2" (#440019) compression faucets (standard)
**Drawing TS-119A	Dairy metal 1½" (#440017) plug type draw-off faucet (standard) - Obsolete as of 1/1971
Drawing TS-118A	Dairy metal 1½" (#440017) and 2" (#440073) plug type draw-off faucets with bayonet lock

INSTRUCTIONS FOR INSTALLING NEW TANGENT DRAW-OFF COMPRESSION TYPE FAUCET OR PLUG TYPE FAUCET ON LEGION KETTLES	LEGION EQUIPMENT CO., INC.	
	DWN ALO / DATE 6/2/75	TS-117
	APP OBB / DATE 6/2/75	
	ECN. 715 / REV. B	SH.2 of 2 A



These strainers are of the self-locking type and are inserted into the tangent draw-off tube. In order to lock them securely into place, the strainer must be pulled forward in the direction of the draw-off tube.

When the strainer is properly inserted, the peripheral edge of the 9" strainer plate must contact the inner shell.

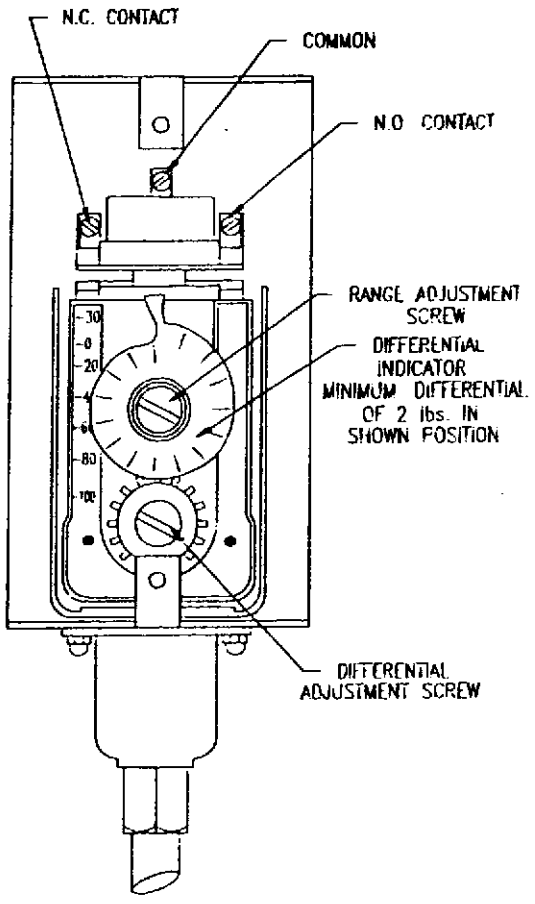
If the prongs fit too tightly or too loosely, the spring action of the prong can be corrected by either spreading or closing the prong.

NOTE: When ordering parts, always refer to complete catalog number, serial number, and capacity of the kettle involved.

LEGION STANDARD TANGENT STRAINER PN. 400269 WITH 1/8" PERFORATIONS (SPAGHETTI STRAINER) FOR ALL STEAM JACKETED KETTLES WITH A 1-1/2" OR 2" TANGENT DRAW-OFF FAUCET.

LEGION INDUSTRIES, INC.

TS-123A



FUNCTION:

This pressure control is used when specified, as a limit switch in addition to the thermostatic selective cycling control. When the limit switch is furnished on original equipment it is factory preset to trip at between 25 to 27 p.s.i. The cycling of the switch can be maintained within a differential from 2 to 15 p.s.i.

GENERAL DESCRIPTION:

This type pressure switch is activated by the steam pressure generated against a compression spring and a bellows. When the spring compression is overcome by the generated pressure within the bellows, the single pole, double throw electric switch breaks the electric circuit of the normally closed side (N.C.) of the switch, thus de-energizing the control circuit and cutting off power to the heating elements or gas supply. As pressure drops, the spring compression will overcome the steam pressure within the bellows and the switch will return to its normally closed position (N.C.), restoring current to the control circuit.

ADJUSTMENT

When a replacement switch is installed in the field, the cut-out and cut-in pressure setting may require calibration. Observe pressure gauge for desired operation of the switch. To raise both cut-in and cut-out pressure, turn the slotted range adjustment screw clockwise. to decrease turn counter-clockwise. A quarter of a turn adjustment may change the pressure by as much as 5 p.s.i. in the 25 lbs. range.

To reduce the difierential, turn the slotted differential adjustment screw clockwise, to increase the differential turn the screw counter-clockwise.

Terminal screw N.C. and "common" are used only for activating the single pole, double throw switch. Terminal screw N.O. is not used in this application.

This switch being of compact design, there will be only rare cases of difficulties with possibly leaking bellows or electrical switch failure. In the event repairs to the pressure switch are necessary, we suggest replacement.

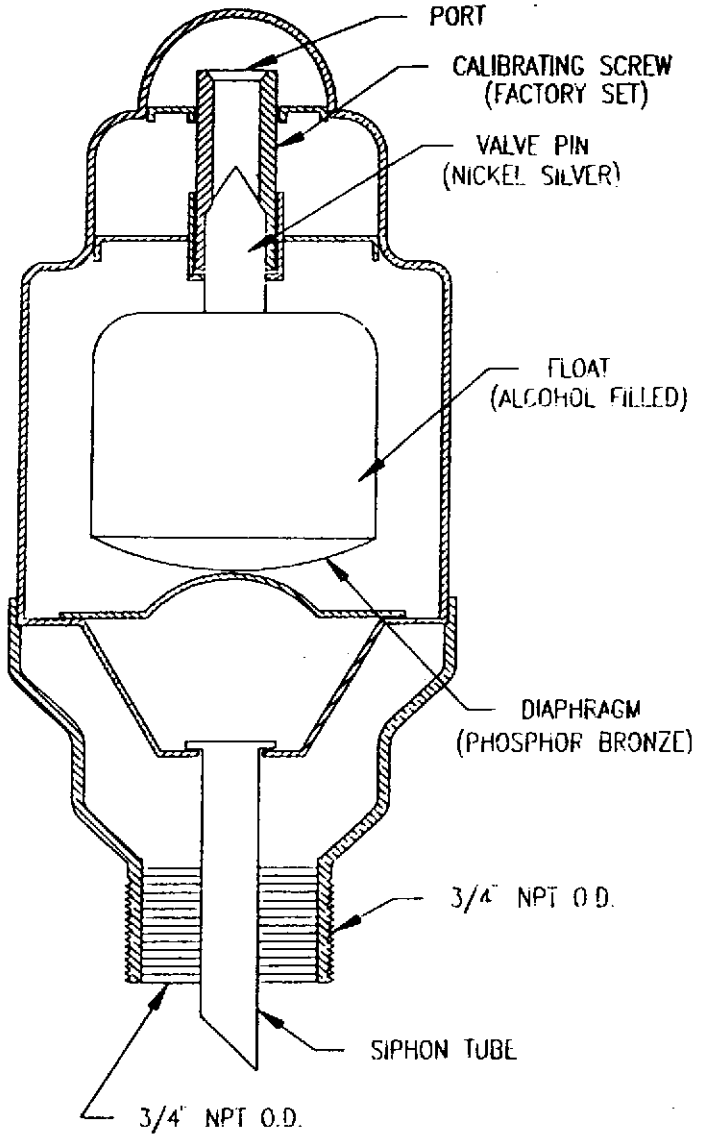
NOTE: When ordering parts, always refer to complete catalog number, serial number, and capacity of the kettle involved. When gas or electric heated, give full characteristics of the gas or electrical system.

PRESSURE LIMIT CONTROL 836-C 6A LEGION CATALOG NO. 430083, AS USED ON LGB GAS AND LEC ELECTRIC KETTLES AND MILITARY MODELS, OPTIONAL WHEN SPECIFIED. RATING 5 AMPS 220 VOLTS, 3 AMPS 600 VOLTS

LEGION

LEGION INDUSTRIES, INC.

TS-124A



PURPOSE OF VALVE:

Complete air elimination of the steam generator chamber is necessary to acheive maximum efficiency for the generation of steam at the proper saturated temperatures in the shortest possible time.

The #55 control is designed to withstand internal pressures up to 35 psi.

FUNCTION OF VALVE:

In cold condition, the diaphragm of the alcohol filled float is in concave, or nearly flat shape, allowing the float to drop, which in turn withdraws the valve pin from the seat, and allows cold and warm air to escape as the water is being heated up in the steam generator.

As the steam begins to develope, and enters the float chamber, the diaphragm expands to a convex shape, raising the entire float and valve pin, thereby shutting the valve orfice.

As steam begins to develop and enters the float chamber, the diaphragm expands to a convex shape, raising the entire float and valve pin, thereby shutting the valve orfice. This function takes place at about 190°F. As long as the valve chamber is filled with steam it stays closed. When the chamber cools off, the diaphragm reverts to its flat condition, dropping the float and admitting fresh air from the outside to prevent the formation of any vacuum.

Any condensate having assembled in the float chamber is returned into the vessel through the syphon tube. The control is made of brass, chrome-plated. The hinge pin is of nickel-silver. The diaphragm is of phosphor bronze. This control does not require any adjusting. It is a rugged device and free of service problems. In the rare cases that the device should be defective, replacement of a new unit is recommended. Field repairs should not be attempted.

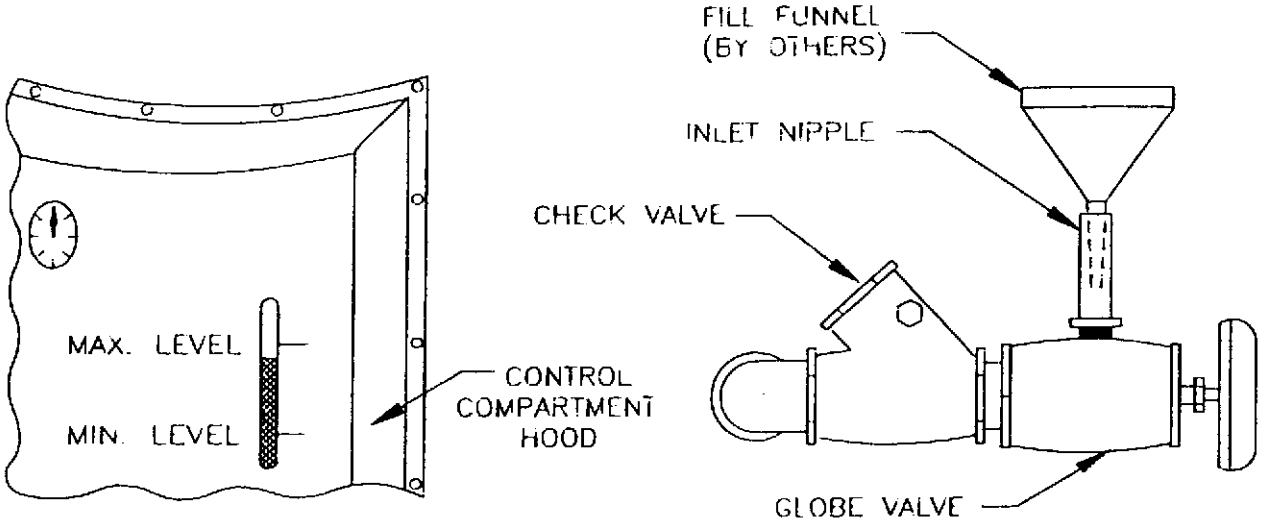
NOTE: When ordering parts, always refer to complete catalog number, serial number, and the capacity of the kettle involved.

STYLE #55 AIR ELIMINATOR VALVE,
LEGION CATALOG NO. 46000 AS USED ON LEGION
LGB GAS AND LEC ELECTRIC HEATED KETTLES.

LEGION INDUSTRIES, INC.

TS132A

GALLONS OF DISTILLED WATER CHARGE					
MODEL TYPE	20	30	40	60	80
LEC, HEC	15–1/2	16–1/2	23	30	45
LGB, LGBE	8	8	11–1/2	14	23



CAUTION: Steam jacket should be filled with distilled water or water having a hardness no greater than 2.0 grains and a pH between 6.0 and 7.5 only. See the above table for the quantity of water required to fill the steam jacket to the proper level.

TO ADD WATER TO THE STEAM JACKET

1. Allow kettle to cool. Never attempt to add water to a hot kettle.
2. Lift the safety valve lever to release any residual steam contained in the steam jacket.
3. Place the thermostat in the off position. Disconnect electric power at the customer supplied electrical cut–off device.
4. Open the globe valve and place a funnel in the inlet nipple. See the above sketch.
5. Pour water into funnel. Lift safety valve lever to allow air to escape from the jacket. Continue adding water until water in the jacket exceeds the minimum level. Do not fill above maxiumum level.
6. Remove the funnel, close the globe valve tightly, and restore power to the kettle.

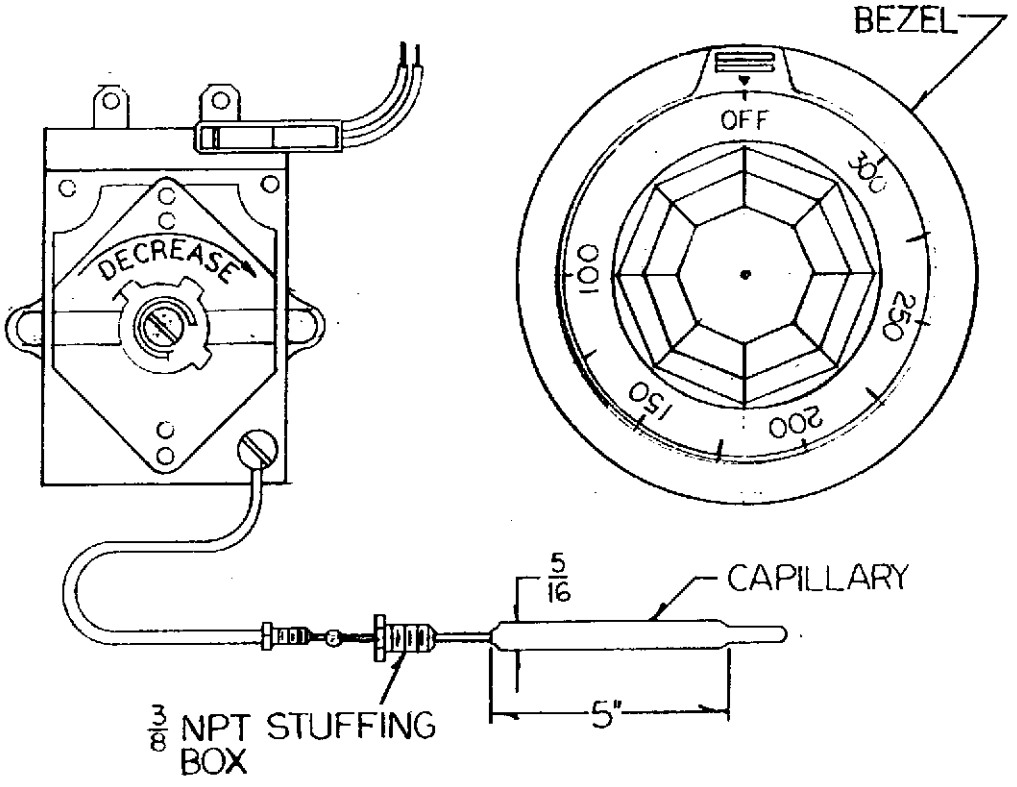
CAUTION: Drain the steam jacket if the kettle is stored in an unheated area. Water freezing in the steam jacket may result in permanent damage to the unit.

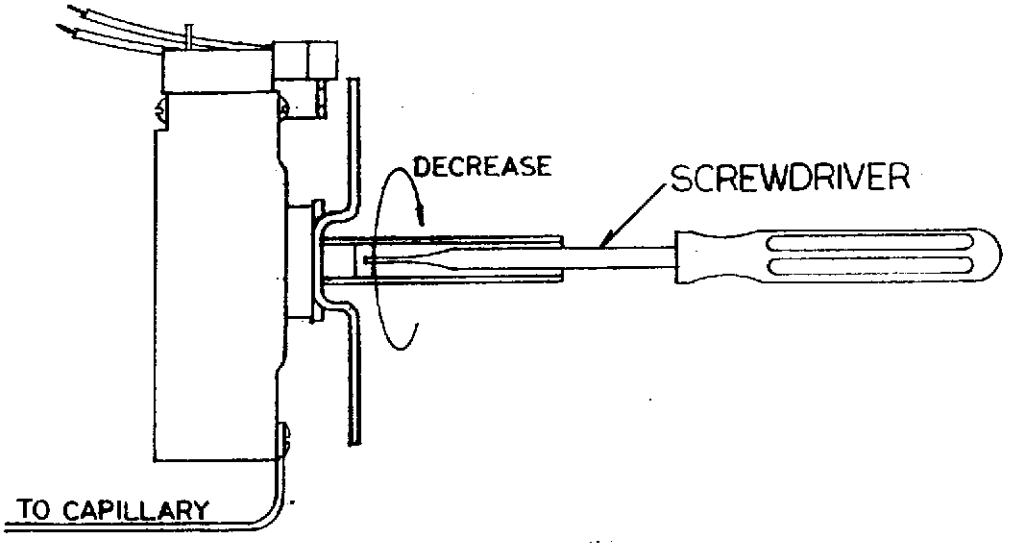
APPLIANCE FAILURE CAUSED BY INADEQUATE WATER QUALITY IS NOT COVERED UNDER WARRANTY.

TECH SERVICE BULLETIN FOR FILLING STEAM JACKETS
MODELS – LEC, HEC, LGB, LGBE

LEGION
LEGION INDUSTRIES, INC.

TS–217A





MANUFACTURER'S NO.	LEGION NO.
KXP 27-24	430093

TECH. SERVICE BULLETIN FOR KXP THERMOSTAT

LEGION EQUIPMENT COMPANY		
DWN KE	DATE 11-19-79	TS-218A
APP AMW	DATE	
REV	SCALE	sheet 1 of 3

The KXP Thermostat is standard equipment on all Legion Kettles.

Type

This thermostat is a snap-action, single pole, single throw cycling control, with silver contacts. Contacts break on temperature rise and make when temperature falls below dial setting.

Rating

This control is rated for 50 volt-amperes, pilot duty 120-277 volts AC. U/L recognized for 100,000 test cycles.

Function

The temperature sensing bulb is immersed in the pressurized steam jacket of the kettle and is responsive to selected dial temperatures from 100° to 300°F. The food temperature in the kettle can be correlated to the selected temperature of the steam as the active cooking medium.

Calibration

The KXP thermostat is an extremely reliable control and it is carefully calibrated at the factory. Field recalibration is seldom necessary, and should not be resorted to unless considerable experience with equipment proves that the control is not maintaining the temperatures to which the dial is set.

Should recalibration be required, use the following procedure:

1) Allow kettle to come to a stable temperature.

2) Turn dial and compare setting on dial with the reading of thermometer* when control turns off. (It will make an audible click and pilot light will go off.)

3) If thermostat and thermometer agree within the users degree of accuracy, no recalibration is necessary. If they do not agree, continue as follows.

4) Set dial to thermometer reading. Pull off dial and with a small screwdriver turn small adjusting screw until thermostat clicks off. (Adjusting screw is in the center of the dial shaft. See drawing.)

   A. CAUTION - Always use extreme care so that the slot in the center adjusting screw is not damaged.

   B. Hold dial shaft tightly while turning center screw.

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* To check kettle temperatures when recalibrating, use a precision test instrument or a reliable mercury thermometer. Place the thermocouple of test instrument or thermometer in the middle of the kettle.

TECH. SERVICE BULLETIN FOR KXP THERMOSTAT	LEGION EQUIPMENT COMPANY		
	DWN	DATE 11-19-79	TS-218A
	APP AMW	DATE	
	REV	SCALE	sht 2 of 3

C. Turning center adjusting screw in a clockwise direction will decrease the temperature; and in a counter-clockwise direction will increase the temperature. Each quarter turn of the screw will change the calibration approximately 30°F.

5) Recheck calibration and repeat process if closer calibration is required.

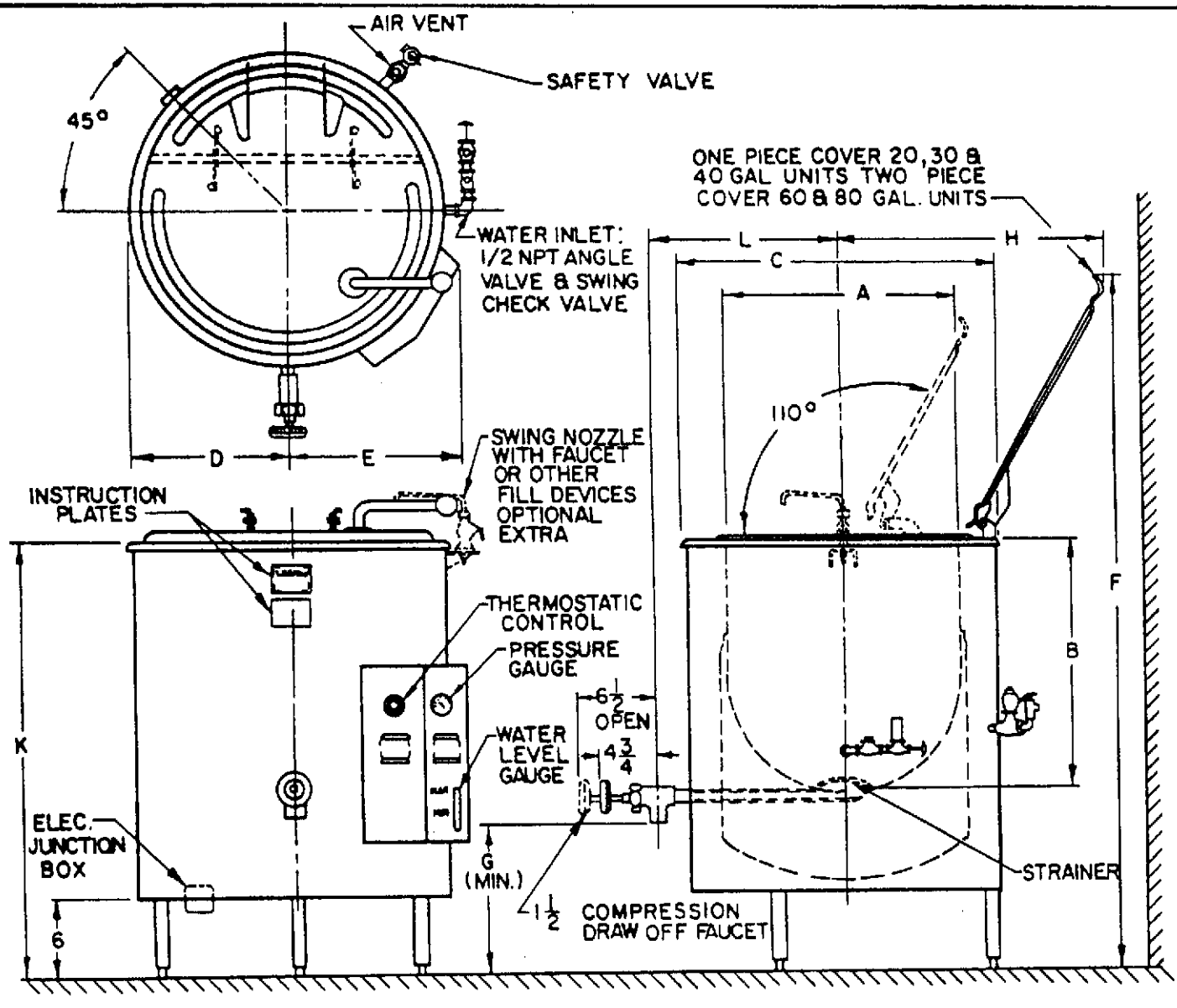
NOTES:

The thermostat has an internal stop to limit the selection of temperature to 270°F.

This is required in order to prevent premature blow-off of the safety valve furnished with the kettle. The safety valve is set at 30 lbs. and has a tolerance of ±10%.

Servicing of this equipment should be referred to qualified service technicians with reputable experience. Legion is not responsible for any equipment serviced or installed by non-qualified personnel.

TECH. SERVICE BULLETIN FOR KXP THERMOSTAT	LEGION EQUIPMENT COMPANY		
	DWN	DATE 11-19-79	TS-218A
	APP AMW	DATE	
	REV	SCALE	sht 3 of 3



DIMENSIONS ±¼						
GAL	20	30	40	60	80	
A	22	23	23½	29½	32½	
B	16	20¼	22¼	25	27⅝	
C	28¼	29¼	31¾	35¾	38¾	
D	14⅛	14⅝	15⅞	17⅞	19⅜	
E	19⅛	19⅝	20⅞	22⅞	24⅜	
F	56	63	64	74	79¾	
G	13	14¾	13¼	14½	15	
H	23	24	24½	26½	29	
K	31½	37½	38	42	45	
L	17¼	17¾	19	22	22½	

KW (NOM) LEC / HEC	9 / 12	12 / 24	15 / 24	24 / 36	30 / 36	
VOLT / PH	AMPS					
208/1	43 / 54	54 / 108	72 / 108	108 / 163	144 / 163	
208/3	25 / 31	31 / 63	42 / 63	63 / 94	84 / 94	
240/1	38 / 50	50 / 100	63 / 100	100 / 150	125 / 150	
240/3	22 / 29	29 / 58	36 / 58	58 / 87	72 / 87	
480/3	11 / 14	14 / 29	18 / 29	29 / 43	36 / 43	

MODEL LEC & HEC (HI INPUT)

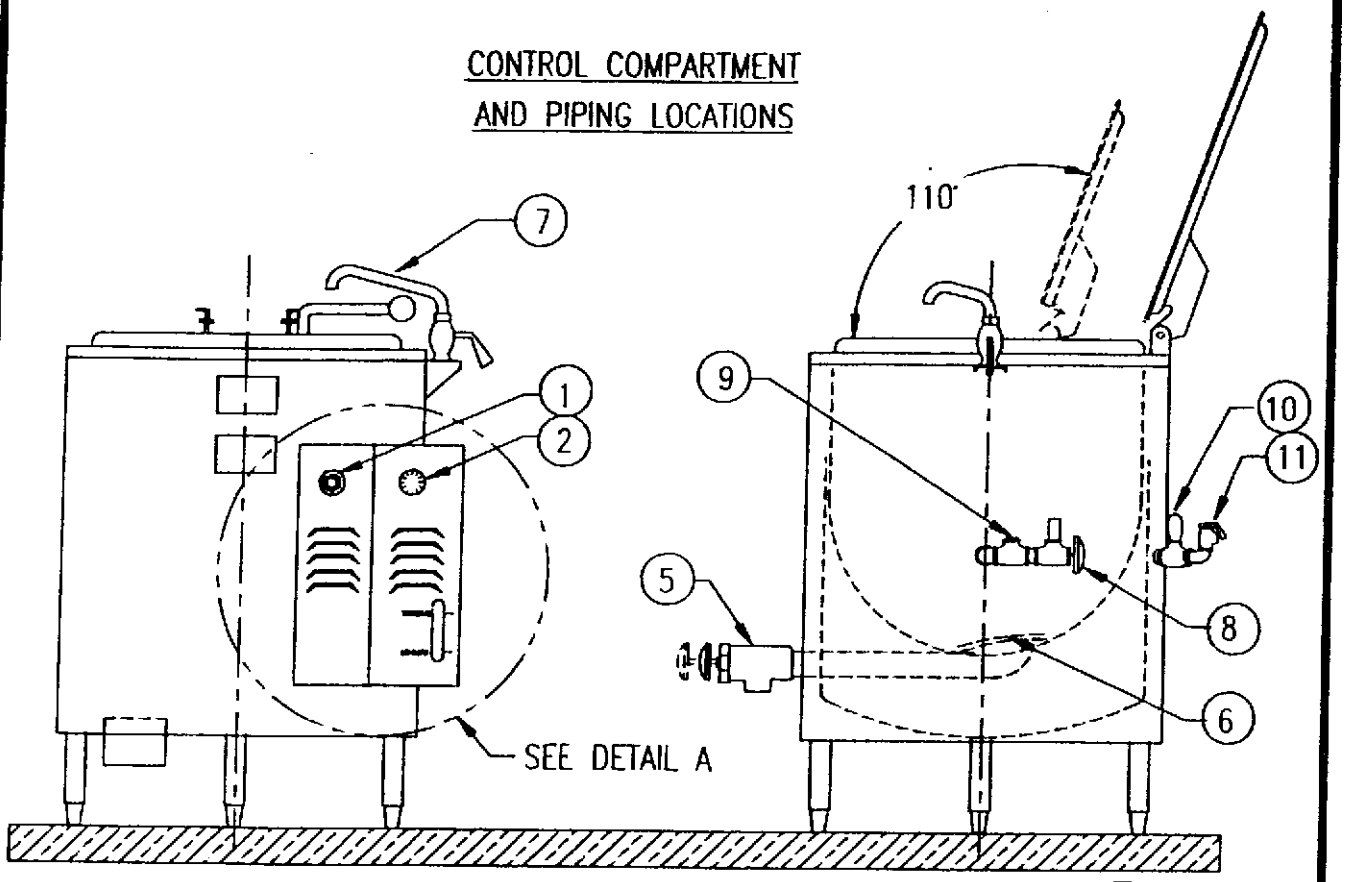
ELECTRIC HEATED STEAM JACKETED KETTLE

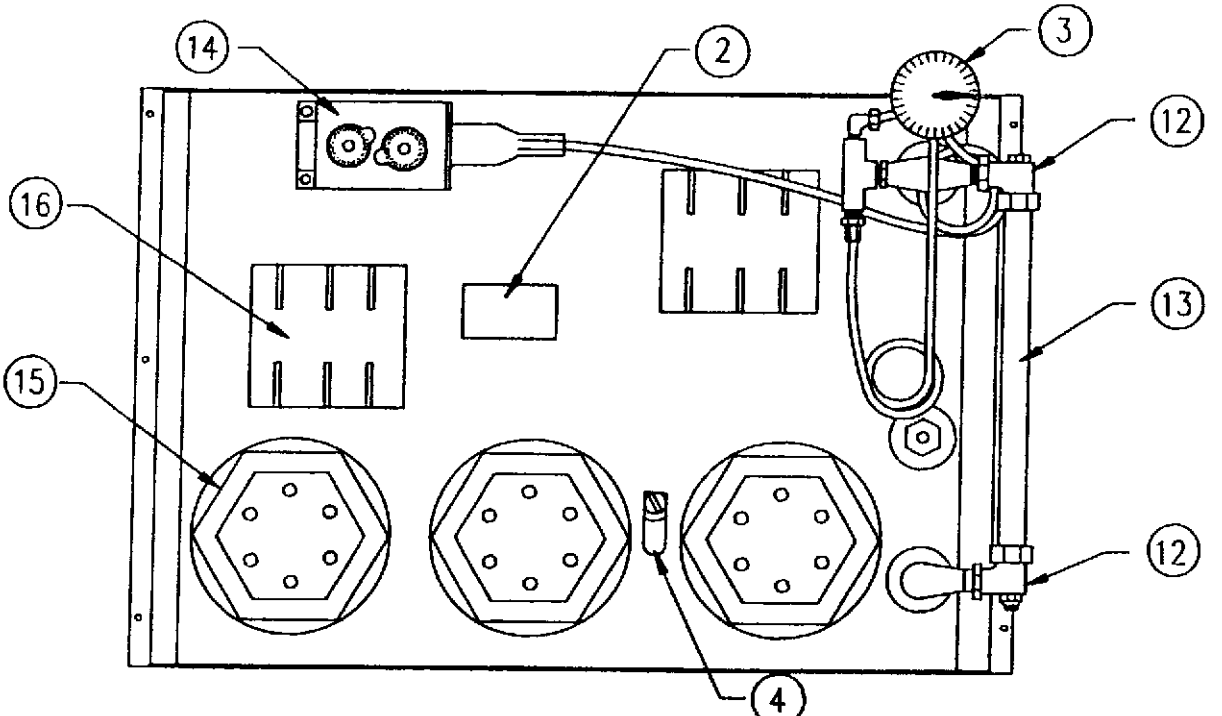
LEGION EQUIPMENT COMPANY

DATE: 4.13.83	DWN.: STR.	R-573A
SCALE: NTS	APPD.:	
REV.	ECO.	

ITEM	DESCRIPTION	LEGION PART NO.	VENDOR PART NO.
1	THERMOSTAT	430093	ROBERTSHAW - KXP-2724
2	LIQUID LEVEL CONTROL	430031	B/W - 1500D
3	PRESSURE GAUGE	440237	MARSH INSTRUMENT -J1114
4	ELECTRODE, WATER	420064	WARRICK - 3H1 D00308
5	FAUCET, COMPRESSION - 1 1/2"	440057	
5	FAUCET, COMPRESSION - 2"	440019	
5	FAUCET, COMPRESSION - 3"	440235	
6	STRAINER-1/4"PERF. - 1 1/2 & 2"D.O.	400270	
6	STRAINER-1/4"PERF. - 3" D.O.	404939-001	
7	FAUCET, W/12" SWING SPOUT	440027	T & S BRASS-B-206
8	VALVE, ANGLE GLOBE	400115	
9	VALVE, SWING CHECK	450480	
10	AIR ELIMINATOR VALVE	460000	DOLE - #55
11	SAFETY RELIEF VALVE (30 PSI)	440168	CONBRACO-10-301-44
12	WATER LEVEL GAGUE	460084	CONBRACO-20-704-03
13	GLASS GAUGE	400511	
14	PRESSURE SWITCH	430083	ALLEN-BRADY-836C6A
15	HEATER	SEE HEATER AND CONTACTOR PARTS LIST	
16	CONTACTOR		

CONTROL COMPARTMENT AND PIPING LOCATIONS





DETAIL A – HOOD REMOVED, WIRING NOT SHOWN
(NUMBER OF HEATERS AND CONTACTORS SHOWN ON SCHEMATICS)

PARTS LIST DIAGRAM,
CONTROL HOOD COMPARTMENT
HEC AND LEC SERIES KETTLES

LEGION
LEGION INDUSTRIES, INC.
TS-240A

PARTS LIST - HEATERS AND CONTACTORS

PARTS DESCRIPTIONS AND VENDOR PART NUMBERS FOLLOW THE TABULATION.

MODEL	VOLTAGE	HEATING ELEMENTS LEGION PART NO.	CONTACTOR LEGION PART NO
LEC-20	208,10	820433	420083
LEC-20	208,30	820433	420083
LEC-20	240,10	820432	420083
LEC-20	240,30	820432	420083
LEC-20	380,30	820432	420083
LEC-20	480,30	820480	420083
LEC-30& HEC-20	208,10	820431	420084
LEC-30& HEC-20	208,30	820431	420083
LEC-30& HEC-20	240,10	820433	420083
LEC-30& HEC-20	240,30	820433	420083
LEC-30& HEC-20	380,30	820433	420083
LEC-30& HEC-20	480,30	820482	420083
LEC-40	208,10	820481	420084
LEC-40	208,30	820481	420083
LEC-40	240,10	820431	420084
LEC-40	240,30	820431	420083
LEC-40	380,30	820431	420083
LEC-40	480,30	820483	420083
LEC-60 HEC-30&40	208,10	820431	420084
LEC-60 HEC-30&40	208,30	820431	420084
LEC-60 HEC-30&40	240,10	820433	420083
LEC-60 HEC-30&40	240,30	820433	420084
LEC-60 HEC-30&40	380,30	820433	420083
LEC-60 HEC-30&40	480,30	820482	420083
LEC-80	208,10	820481	420084
LEC-80	208,30	820481	420083
LEC-80	240,10	820431	420084

LEC-80	240,30	820431	420083
LEC-80	380,30	820431	420083
LEC-80	480,30	820483	420083
HEC-60&80	208,10	820431	420084
HEC-60&80	208,30	820431	420083
HEC-60&80	240,10	820433	420083
HEC-60&80	240,30	820433	420083
HEC-60&80	380,30	820433	420084
HEC-60&80	480,30	820482	420083

LEGION PART NO.	PART DESCRIPTION	VENDOR PART NO.
420083	CONTACTOR, 50 AMP	CUTLER - HAMMER 9560H1415-50
420084	CONTACTOR, 75 AMP	CUTLER - HAMMER 9560H1425-50
820433	HEATER, 240V, 12KW	CHROMALOX MT-360W PCN-156-116018-041
820432	HEATER, 240V,9KW	CHROMALOX MT-34FW PCN-156-116018-048
820431	HEATER, 240V, 15KW	CHROMALOX MT-375W PCN-156-116018-042
820481	HEATER, 208V, 15KW	CHROMALOX MT-375W PCN-156-116018-005
820480	HEATER, 480V, 9KW	CHROMALOX MT-345W PCN-156-500500-531
820482	HEATER, 480V, 12KW	CHROMALOX MT-360W PCN-156-116018-003
820483	HEATER, 480V, 15KW	CHROMALOX MT-375W PCN-156-116018-004

SEE THE WIRING SCHEMATICS FOR THE NUMBER OF CONTACTORS AND HEATERS REQUIRED FOR EACH SPECIFIC MODEL AND VOLTAGE.

PARTS AND SERVICE AGENCIES

ALPRO SERVICE CO., INC.
1127 WILLOUGHBY AVE.
BROOKLYN, NY 11237
(718) 386-2515 (P&S)

ARCO ELECTRIC SERVICE, INC.
3035 S.E. 17TH AVE.
PORTLAND, OR 97202
(505) 234-9393 (S)

AUTHORIZED COMM.
FOOD EQUIPMENT SERVICE, INC.
1938 E OSBORN ROAD
PHOENIX, AZ 85016
(602) 234-2443 (S)

BRESSIE COMPANY
922 SOUTHEAST OAK STREET
PORTLAND, OR 97214
(503) 231-7171 (P&S)

BROWARD GAS SERVICE, INC.
3121 NE 16TH, TERRACE
POMPANO BEACH, FL 33064
(305) 971-0456
(800) 253-0200 (P&S)

BURNEY'S COMMERICAL SER., INC.
2103 KALIAWA STREET
HONOLULU, HI 96819
(808) 841-0427 (P&S)

COASTLINE PARTS CO.
3722 N PACE BLVD.
PENSACOLA, FL 32503
(904) 432-2448 (S)

COMMERICAL PARTS & SER., INC.
1150 W. MOUND STREET
COLUMBUS, OH 43223
(614) 221-0057 (P&S)

ELECTRIC MOTOR REPAIR
700 EAST 25TH STREET
BALTIMORE, MD 21218
(301) 467-8080 (P&S)

FOOD EQUIPMENT SERVICE CO.
3011 IND. PARKWAY EAST
KNOXVILLE, TN 37921
(615) 522-5764 (S)

FOOD EQUIPMENT SERVICE, CO.
6633 W. NATIONAL
MILWAUKEE, WI 53214
(414) 257-4008 (S)

GSC SERVICE, INC.
8360 CLAIREMONT MESA BLVD.
SAN DIEGO, CA 92111
(619) 565-6672 (S)

GCS SERVICE, INC.
2542 PRATT BLVD.
ELK GROVE VILLAGE, IL 60007
(312) 593-5200 (S)
(800) 942-9689 (IL WATTS)
(800) 323-5934 (OUTSIDE WATTS)

GCS SERVICE, INC.
815 CAMBRIDGE STREET
CAMBRIDGE, MA 02141
(617) 426-8962
(800) 225-1155 (P&S)

GCS SERVICE, INC.
21578 DEQUINDRE ROAD
WARREN, MI 48091
(313) 756-4210
(800) 722-2936 (P&S)

GCS SERVICE, INC.
9722 REAVIS PARK DRIVE
ST. LOUIS, MO 63122
(314) 638-7444
(800) 325-3223 (P&S)

DRICO CORP.
2382 CARROLL AVE.
ATLANTA, GA 30341
(404) 458-2275
(800) 233-7426 (P&S)

DRICO CORP.
31 PROSPECT AVE.
WEST HARTFORD, CT 06106
(203) 236-4541 (P&S)

GCS SERVICE, INC.
1020 WATERMAN AVE.
E. PROVIDENCE, RI 02914
(401) 434-6803 (S)

GCS SERVICE, INC.
2422 ARBUCKLE
DALLAS, TX 75229
(214) 638-3160
(214) 848-2955 (P&S)

GENERAL PARTS & SUPPLY
720 EAST LAKE STREET
MINNEAPOLIS, MN 55407
(612) 827-5581
(800) 328-5032 (OUTSIDE MN)
(800) 582-5165 (P&S)

GOLDEN STATE APPLIANCE
15014 STAFF COURT
GARDENA, CA 90057
(213) 515-0123 (S)

JAY HILL REPAIRS CO.
P.O. BOX 191
PINE BROOK, NJ 07058
(201) 575-9145 (S)

J.M. & G. APPLIANCE SERVICE
RT. 7, BOX 492
RT. 526
JACKSON, NJ 08527
(201) 928-4144 (S)

METRO APPLIANCE SERVICE
1640 SO. BROADWAY
DENVER, CO 80210
(303) 778-1126 (S)

OLD DOMINION SERVICE
929 W. 21ST. STREET
NORFOLK, VA 23517
(804) 622-3627
(804) 622-8866 (S)

OLD DOMINION SERVICE
2 WEST CARY STREET
RICHMOND, VA 23220
(804) 664-1675 (S)

PACIFIC COAST PARTS
DISTRIBUTOR, INC.
15024 STAFF COURT
GARDENA, CA 90057
(213) 515-0207 (P)
(800) 421-5080 (NAT'L WATTS)
(800) 262-1312 (CA WATTS)

REST. APPL. SERVICE INC.
7219 ROOSEVELT WY. NE
SEATTLE, WA 98115
(206) 524-8200 (S)

ROSS COMMERCIAL SERVICE
3635 PEARL STREET
JACKSONVILLE, FL 32206
(904) 355-2695 (S)

ELMER SCHULTZ SERVICE, INC.
540 N. 3RD STREET
PHILADELPHIA, PA 19123
(215) 627-5400 (S)

TOTAL SERVICE COMPANY
545 3RD STREET
MACON, GA 31201
(912) 743-6505 (S)

W.H. KIRK CO.
1100 CORDELL
P.O. BOX 8726
HOUSTON, TX 77009
(713) 869-9511 (S)
(713) 861-2301 (SERVICE)

KRUEGER, INC.
100 NE 24TH
OKLAHOMA CITY, OK 73105
(405) 528-888 (S)

WHALEY ELECTRICAL SERVICE
P.O. BOX 4023
WEST COLUMBIA, SC 29171
(800) 845-9382 (P&S)

P = PARTS

S = SERVICE

* **NOTE :** ANY AREAS NOT LISTED, ARE COVERED BY SUBAGENCIES OR FACTORY DIRECT.

LEGION LIMITED WARRANTY

LEGION INDUSTRIES, INC., WARRANTS THAT ALL EQUIPMENT, AS SUPPLIED TO THE ORIGINAL PURCHASER, TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE FOR A PERIOD OF ONE YEAR FROM DATE OF INSTALLATION OR FIFTEEN MONTHS FROM DATE OF SHIPMENT, WHICHEVER IS SOONER.

IT UPON INSPECTION BY LEGION OR THEIR FRANCHISED SERVICE AGENCY, IT IS DETERMINED THAT THE EQUIPMENT HAS NOT BEEN PROPERLY INSTALLED, HAS NOT BEEN USED IN AN APPROPRIATE MANNER, HAS BEEN MODIFIED, HAS NOT BEEN PROPERLY MAINTAINED, OR HAS BEEN SUBJECT TO MISUSE OR MISAPPLICATION, NEGLECT, ABUSE, ACCIDENT, DAMAGE DURING TRANSIT OR DELIVERY, FIRE, FLOOD, RIOT OR ACT OF GOD; THEN THIS WARRANTY SHALL BE VOID.

REPAIRS UNDER THIS WARRANTY ARE TO BE PERFORMED ONLY BY A LEGION FRANCHISED SERVICE AGENCY, PROVIDED THIS WORK IS AUTHORIZED IN ADVANCE BY AUTHORIZED FACTORY PERSONNEL. LEGION WILL REPLACE ALL PARTS, REIMBURSE FOR LOCATION LABOR, AND PAY TRAVEL MILEAGE, NOT BE EXCEED A TOTAL OF FIFTY MILES.

LEGION SHALL, AT THIER OPTION, REPAIR OR REPLACE, WITHOUT CHARGE, ANY PART OR PRODUCT WHICH THEIR EXAMINATION DISCLOSES TO BE DEFECTIVE.

NOTE: ANY PART TO BE RETURNED TO FACTORY MUST HAVE PRIOR WRITTEN AUTHORIZATION.

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(NAVSEA S0005 – AA – GYD – 030/TMMP & NAVSEAINST 4160.3A)

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